Recent Articles on Mathematics

By Michael Griffin

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GL vol 2, n.9, November-December 1961

GL vol 2, n.21, June 1963

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Introduction

This is a collection of postings from my blog site Mythic Algebra and Other Things. These newer articles are not directly connected to my mathematical ideas which I have named mythic algebra. All of those articles and published academic papers were collected into a previous e-book with the name of the blog site as its title. These more recent posts address two new topics: Fermat's Last Theorem (FLT) and a single-field approach to a unified field theory (UFT) for physics. Following the order of their scheduled posting, they fall into yearly trios whose numbering will be a continuation of the previous collection, thus here they begin with the 4th Trio. The last, 6th Trio consists of earlier versions of the single-field UFT article which may only have been posted to show how the ideas developed and to have had something to post in subsequent years on the blog. One can think of the comic book covers as both mental place-holders besides illustrations of the forces under discussion. Eventually there was enough material that the comic book illustrations were no longer necessary.

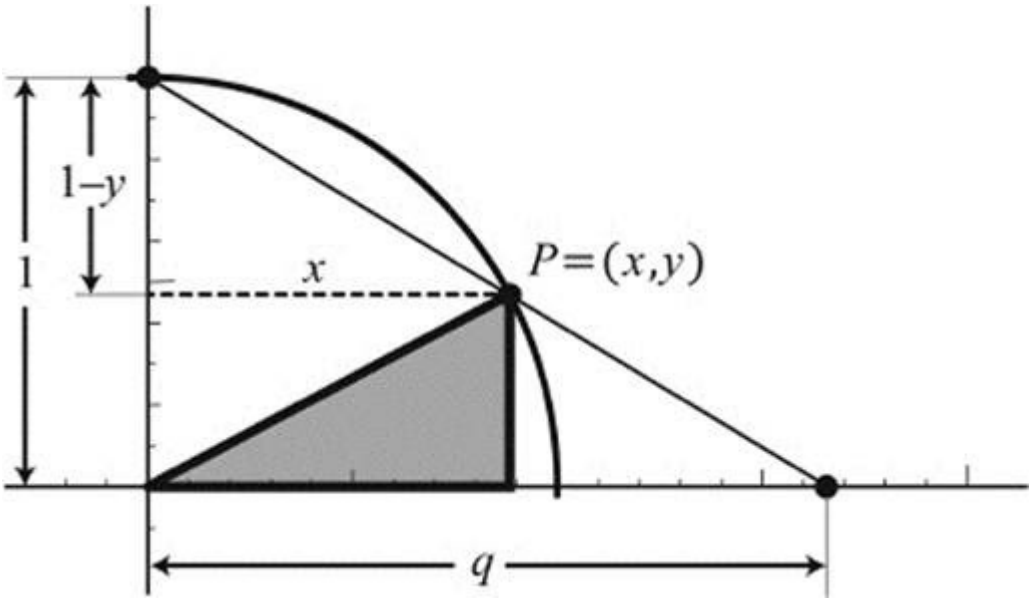
Posted: Aug 2023

Prologue: Curves and Fermat

By Michael Griffin, MLS

In Fermat's Last Theorem, $A^n + B^n = C^n$ has infinitely many solutions for n but the highest whole number solution is 2, as with the sides of a right triangle in the Pythagorean theorem. These solutions are called Pythagorean triples; for example the first ABC is 3 4 5 since 9 + 16 = 25. Although it has been solved by modern methods, Fermat's Last Theorem will continue to draw anyone curious as to a method Fermat himself might have used to solve it. To that end, a few idle investigations are reported here in future posts, with some conclusions that by no means make any proofs except on the set of Pythagorean triples. While these results might make for some interesting algebra, they are so trivial that it is not surprising if no one has published them before. To show just how trivial they are, we will look at some graphs that show the Captain Obvious nature of why any Pythagorean triple would not work at a higher power.

We begin with a graph from an online textbook (schoolbag) which gives a geometric set-up for a proof of Euclid's formula to generate Pythagorean triples:



What matters to us is that the general Pythagorean theorem is converted Into a unit circle here by division:

If $A^2 + B^2 = C^2$ then $(A^2 + B^2 = C^2) / C^2$ and $A^2 / C^2 + B^2 / C^2 = C^2 / C^2$

and $A^2 / C^2 + B^2 / C^2 = 1$ so we define $A^2 / C^2 = X^2$ and $B^2 / C^2 = Y^2$

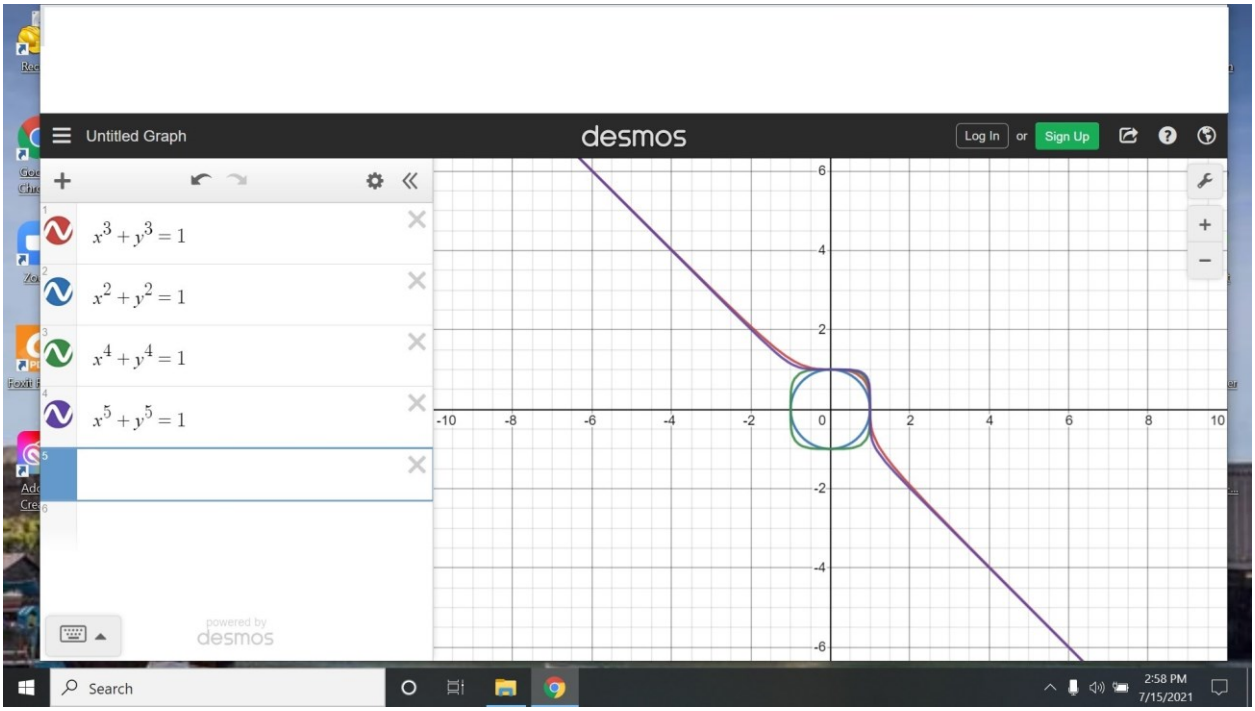
So we have a unit circle of $X^2 + Y^2 = 1$ shown in the first quadrant above.

The natural number solutions for Pythagorean triples will lie on the unit circle.

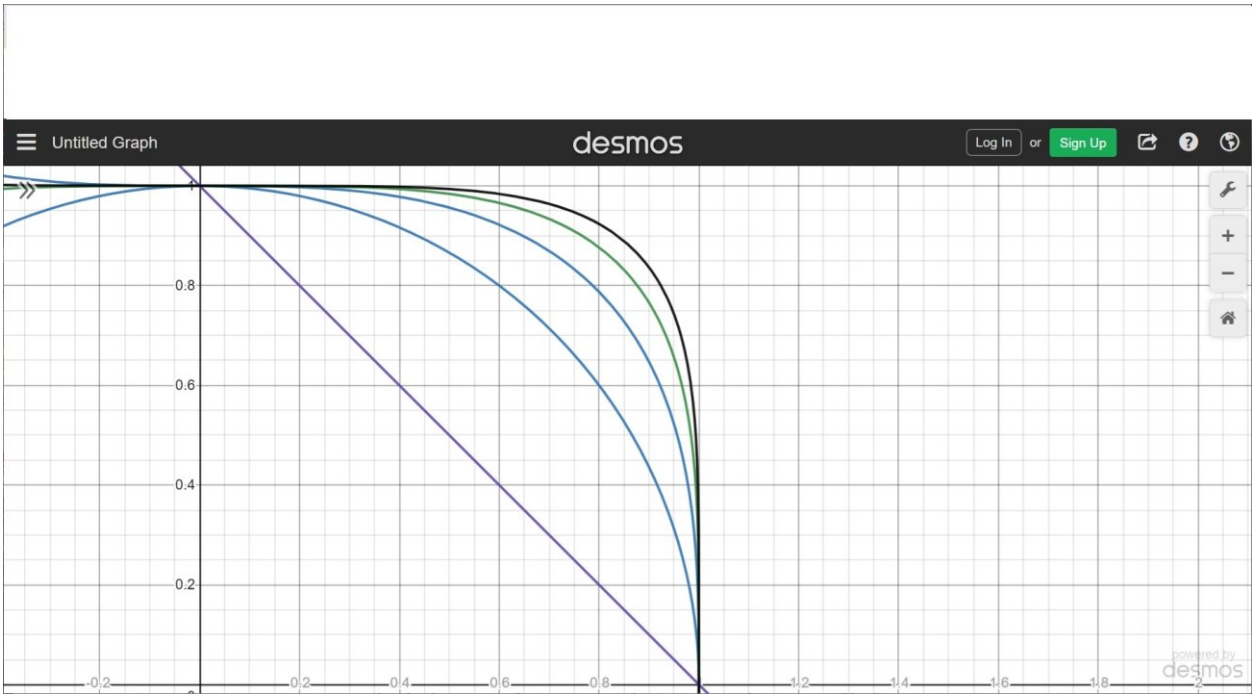
It is easy enough to show that these points will stay on the unit circle and not appear in higher curves.

With the same kind of division process we can turn higher powers into unit equations and graph them. So $A^3 + B^3 = C^3$ becomes $X^3 + Y^3 = 1$, $A^4 + B^4 = C^4$ becomes $X^4 + Y^4 = 1$, $A^5 + B^5 = C^5$ becomes $X^5 + Y^5 = 1$, etc. Using the online Desmos graphing calculator we can show these equations and their curves.

Even powers give closed figures starting with a circle n = 2 whereas odd powers have unbounded lines that in the first quadrant curve out near the even powers.



We zoom in on the first quadrant because it would be the positive values to fit Fermat's theorem. Zooming in also shows that as n increases the curvature moves further out from the circle in an orderly progression. The straight line is our beginning baseline when n = 1 so X + Y= 1.



The curves never intersect except at the points (0,1) and (1,0). So any natural number Pythagorean triples never happen on higher power curves, which is a visual depiction that these triples would never provide solutions to Fermat's Last Theorem. All of these graphs simply serve as alternative proofs of the algebra to come.

Sources

https://www.desmos.com/calculator

EUCLID'S METHOD FOR FINDING PYTHAGOREAN TRIPLES

https://schoolbag.info/mathematics/numbers/79.html

4th Trio: Fermat and Triples

Posted: Sep 2023

Pythagoras and Fermat

By Michael Griffin MLS

Although it has been solved by modern methods, Fermat's Last Theorem will continue to draw anyone curious as to a method Fermat himself might have used to solve it. To that end, a few idle investigations are reported here, with some conclusions that by no means make a rigorous proof. Call this an intuitive

approach. I cannot even claim that this work has not.been previously done by others, as the first part of it was clearly accomplished by Pythagoras.

In Fermat's problem:

$A^n + B^n = C^n$ has infinitely many solutions for n but the highest whole number solution is 2, as with the sides of a right triangle in the Pythagorean theorem:

$A^2 + B^2 = C^2$

And Pythagoras found that you can always generate solutions from

$A^2 = B + C$ where $C - B = 1$

This is almost a midpoint formula since the length of A^2 is divided by a midpoint which is added to length B to make length C. The clear property of this type of Pythagorean midpoint triple is that every single odd digit is the beginning of a set of Pythagorean triples. 3, 5, 7, … etc all fit the same formula that generates triples. We get (3,4,5) (5,12,13) (7,24,25) … etc.

The same cannot be said for the second digit B. We cannot say that every even digit B is part of a set of triples, but there is something we can say. I do not know who is the first person to notice the next property. There is a clear relation between subsequent B digits proceeding off of an increasing sequence of triples: the next B digit that fits a triple pattern is 4n more than the previous:

$B_n = B_{n-1} + 4n$

Where n is the ordinal value of that triple. So after 7 is 9 for the 4th triple, n=4, 24+4(4)=24+16=40 so the next triple is (9,40,41) and $81+1600=1681=41^2$.

It doesn't take much work to see this pattern.

Set up a row of the first 6 even members of Pythagorean midpoint triples:

4, 12, 24, 40, 60, 84

Then make a row of the increasing distance between members:

8, 12, 16, 20, 24

The common factor is 4 so divide it out:

2, 3, 4, 5, 6

Which gives the n-ordinal value of that member's triple.

So each next B value is 4n more than the previous one.

Again, $B_n = B_{n-1} + 4n$ formula notation, however that is as far as that goes for now.

We shall set it aside and instead make a generalization of the Pythagorean midpoint formula for triple solutions (A,B,C) where n is any positive whole digit:

$A^n = B^{n-1} + C^{n-1}$

As with Fermat's theorem, this is easily true if we make no restrictions on the values of A,B,C, or n. For the sake of argument and the rules of the game, we make the unfounded assumption that A,B,C, and n are natural numbers only. This unfounded postulate is the beginning of our adventure into an unjustified non rigorous invalid yet intuitive proof that there are no solutions for this kind of Pythagorean midpoint triple for n greater than 2:

If $A^3 + B^3 = C^3$ then

$A^3 = B^2 + C^2$ and substituting into the first equation:

$B^2 + C^2 + B^3 = C^3$ rearranging:

$B^2 + B^3 = C^3 - C^2$ and factoring:

$B^2 (1 + B) = C^2 (C - 1)$

For the smallest pair of C - B = 1 (B,C) is (1,2)

$1^2 (1 + 1) = 2^2 (2 - 1)$

1(2) = 4(1) = 4 2= 4 false

The larger (B,C) gets, the worse the inequality gets:

Take the next pair (2,3)

$2^2 (1 + 2) = 3^2 (3 - 1)$

4(3) = 9(2) = 18 12 = 18 false

The inequality has grown from a difference of 4 - 2 = 2 to 18 - 12 = 6

And it will just get bigger.

Also the larger n gets, the worse the inequality gets:

Instead of n = 3 let n = 4

If $A^4 + B^4 = C^4$ then

$A^4 = B^3 + C^3$ and substituting into the first equation:

$B^3 + C^3 + B^4 = C^4$ rearranging:

$B^3 + B^4 = C^4 - C^3$ and factoring:

$B^3 (1 + B) = C^3 (C - 1)$

For the smallest pair of C - B = 1 (B,C) is (1,2)

$1^3 (1 + 1) = 2^3 (2 - 1)$

1(2) = 8(1) = 8 2= 8 false

The inequality has grown from a difference of 4 - 2 = 2 to 8 - 2 = 6

And it will just get bigger.

So as pairs (B,C) or the power n increases, so does the inequality.

So if C - B = 1 there is no A,B,C for n > 2 such that

$A^n = B^{n-1} + C^{n-1}$

So there is no A,B,C for n > 2 such that

$A^n + B^n = C^n$

■

QED

This only applies to Pythagorean midpoint triples based on the unfounded postulate:

$A^n = B^{n-1} + C^{n-1}$ Other articles will address formulas made by Euclid and Plato.

Sources

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Posted: Oct 2023

Euclid and Fermat

By Michael Griffin, MLS

Although it has been solved by modern methods, Fermat's Last Theorem will continue to draw anyone curious as to a method Fermat himself might have used to solve it. To that end, a few idle investigations are reported here, with some

conclusions that by no means make a rigorous proof. Call this an intuitive approach. I cannot even claim that this work has not.been previously done by others, as the first part of it was clearly accomplished by Euclid.

In Fermat's problem:

$A^N + B^N = C^N$ has infinitely many solutions for N but the highest whole number solution is 2, as with the sides of a right triangle in the Pythagorean theorem: $A^2 + B^2 = C^2$

As with Fermat's theorem, this is easily true if we make no restrictions on the values of A,B, or C. For the sake of argument and the rules of the game, A,B,C, and N in Fermat's, are natural numbers only.

Euclid is credited with a formula to generate all possible Pythagorean triples: for any natural numbers m and n, m>n, a triplet of (A,B,C) results from (m^2-n^2, 2mn, m^2+n^2).

For example, (m,n) of (2,1) makes (3,4,5), the first such triple, for 9+16=25.

Let us begin our intuitive proof by expanding Euclid's formula in the power of two:

$(m^2-n^2)^2 + (2mn)^2 = (m^2+n^2)^2$ is $A^2 + B^2 = C^2$ and we get:

$m^4-2m^2n^2+n^4 + 4m^2n^2 = m^4+2m^2n^2+n^4$

Cancelling terms leaves $-2m^2n^2 + 4m^2n^2 = 2m^2n^2$ or $4m^2n^2 = 4m^2n^2$

A trivial result that we see has any possible solutions for m and n.

When we go to higher powers we get instead binomial expansions, with alternating +/- terms on the left, and only positive terms canceling on both sides of the equation.

If N=3

$(m^2-n^2)^3 + (2mn)^3 = (m^2+n^2)^3$ is $A^3 + B^3 = C^3$ and we get:

$(m^2-n^2)(m^4-2m^2n^2+n^4) + 8m^3n^3 = (m^2+n^2)(m^4+2m^2n^2+n^4)$ then distributing:

$m^6-2m^4n^2+m^2n^4 - n^2m^4+2m^2n^4 - n^6 + 8m^3n^3 = m^6 +2m^4n^2+m^2n^4 +n^2m^4+2m^2n^4 + n^6$

Cancelling identical terms on both sides leaves:

$-2m^4n^2 - n^2m^4 - n^6 + 8m^3n^3 = 2m^4n^2+n^2m^4+ n^6$

Except for the term $8m^3n^3$ everything on the left is just the negative of what is on the right so let us combine like terms:

$8m^3n^3 -4m^4n^2 -2n^2m^4 -2n^6 = 0$ and then we can divide all by 2

$4m^3n^3 -2m^4n^2-n^2m^4 -n^6 = 0$

then what remains after expansion and cancellation is:

$4m^3n^3 - 3m^4n^2 - n^6 = 0$ and m=n is the solution of this. That is not allowed since the only resulting triple would be $(0, 2m^2, 2m^2)$ which also shows why we need m>n.

N = 3 is the first case where N is odd. What about when N is even? Let's examine the expansion of the A term with its subtraction components if N = 4:

$(m^2-n^2)^4 = (m^2-n^2)^2(m^2-n^2)^2 = (m^4-2m^2n^2+n^4)(m^4-2m^2n^2+n^4) =$

$m^8-2m^6n^2+m^4n^4 -2m^6n^2+4m^4n^4 -2m^2n^6+ m^4n^4 -2m^2n^6+n^8$

The positive terms would be cancelled with their matches in the C term on the other side of the equation, leaving the negative terms: $-4m^6n^2 - 4m^2n^6$

If we bring the remaining C terms over to the left side and write out the full equation we now have:

$(2mn)^4 - 8m^6n^2 - 8m^2n^6 = 0$ Then dividing by 8:

$2m^4n^4 - m^6n^2 - m^2n^6 = 0$ And once again m=n is the natural number solution.

In general, a binomial expansion and cancellation leaves:

$(2mn)^N$ = 2(+/- leftover terms) and so m=n is the solution.

By intuition, any higher powers would result in the same balancing of +/- terms and a final result with m=n the only solution. So if N>2 there is no m>n solution to Euclid's formula.

So there is no A,B,C for N > 2 such that

$A^N + B^N = C^N$

■

QED

Note, it is an unfounded assumption that just because Euclid's formula applies to N=2 it should generalize to all powers. What this exercise shows is that it cannot.

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Posted: Nov 2023

Plato and Fermat

By Michael Griffin MLS

Although it has been solved by modern methods, Fermat's Last Theorem will continue to draw anyone curious as to a method Fermat himself might have used to solve it. To that end, a few idle investigations are reported here, with some conclusions that by no means make a rigorous proof. Call this an intuitive approach. I cannot even claim that this work has not.been previously done by others, as the first part of it was clearly accomplished by Plato.

In Fermat's problem:

$A^N + B^N = C^N$ has infinitely many solutions for N but the highest whole number solution is 2, as with the sides of a right triangle in the Pythagorean theorem: $A^2 + B^2 = C^2$

As with Fermat's theorem, this is easily true if we make no restrictions on the values of A,B, or C. For the sake of argument and the rules of the game, A,B,C, and N in Fermat's, are natural numbers only.

Euclid is credited with a formula to generate all possible Pythagorean triples: for any natural numbers m and n, m>n, a triplet of (A,B,C) results from (m^2-n^2, 2mn, m^2+n^2).

For example, (m,n) of (2,1) makes (3,4,5), the first such triple, for 9+16=25.

Plato has a different formula to generate triples from every even digit B:

$A,B,C,= (B/2)^2 - 1, B, (B/2)^2 + 1$ and $C - A = 2$ always

So if B equals 2 we get (0,2,2) and if B equals 4 we once again get (3,4,5).

Plato's formula does not give all possible triples or even all triples using even numbers, for example it omits (5,12,13). Since it is based on even numbers, we shall see how Plato's formula is a restricted version of Euclid's formula :

First, since B is even we can rewrite it as 2X and X is any natural number.

Substituting into Plato's formula we get:

$A,B,C,= (2X/2)^2 - 1, 2X, (2X/2)^2 + 1 = X^2 - 1, 2X, X^2 + 1$

Comparing this to Euclid's shows that m equals X and n equals 1.

So an intuitive “proof” for Fermat's Last Theorem will be very similar to the proof using Euclid's formula in another article.

In Fermat's theorem:

$A^N + B^N = C^N$ we now have: $(X^2 - 1)^N + (2X)^N = (X^2 + 1)^N$

This is an unfounded assumption that just because Plato’s formula applies to N=2 it should generalize to all powers. At best we will have an unjustified non rigorous invalid yet intuitive proof.

Let us begin our intuitive proof by expanding Plato’s formula in the power of two:

$(X^2 - 1)^2 + (2X)^2 = (X^2 + 1)^2$ is $A^2 + B^2 = C^2$ and we get:

$X^4-2X^2+1 + 4X^2 = X^4+2X^2+1$

Cancelling terms leaves $-2X^2 + 4X^2 = 2X^2$ or $4X^2 = 4X^2$

A trivial result that we see has any possible solutions for X

.When we go to higher powers we get instead binomial expansions, with alternating +/- terms on the left, and only positive terms canceling on both sides of the equation.

If N=3

$(X^2-1^2)^3 + (2X1)^3 = (X^2+1^2)^3$ is $A^3 + B^3 = C^3$ and we get:

$(X^2-1^2)(X^4-2X^21^2+1^4) + 8X^31^3 = (X^2+1^2)(X^4+2X^21^2+1^4)$ then distributing:

$X^6-2X^41^2+X^21^4 - 1^2X^4+2X^21^4 - 1^6 + 8X^31^3 = X^6 +2X^41^2+X^21^4 +1^2X^4+2X^21^4 + 1^6$

Cancelling identical terms on both sides leaves:

$-2X^41^2 - 1^2X^4 - 1^6 + 8X^31^3 = 2X^41^2+1^2X^4+ 1^6$

Except for the term $8X^31^3$ everything on the left is just the negative of what is on the right so let us combine like terms:

$8X^31^3 -4X^41^2 -2(1^2X^4)-2(1^6) = 0$ and then we can divide all by 2

$4X^31^3 -2X^41^2-1^2X^4 -1^6 = 0$

then what remains after expansion and cancellation is:

$4X^3 - 3X^4 - 1 = 0$ and X=1 is the only real solution of this. That is not allowed since the only resulting triple would be (0, 2, 2)

N = 3 is the first case where N is odd. What about when N is even? Let's examine the expansion of the A term with its subtraction components if N = 4:

$(X^2-1^2)^4 = (X^2-1^2)^2(X^2-1^2)^2 = (X^4-2X^2 1^2+1^4)(X^4-2X^2 1^2+1^4) =$

$X^8-2X^6 1^2+X^4 1^4 -2X^6 1^2+4X^4 1^4 -2X^2 1^6+ X^4 1^4 -2X^2 1^6+1^8$

The positive terms would be cancelled with their matches in the C term on the other side of the equation, leaving the negative terms: $-4X^6 1^2 -4X^2 1^6$

If we bring the remaining C terms over to the left side and write out the full equation we now have:

$(2X1)^4 -8X^6 1^2 -8X^2 1^6 = 0$ Then dividing by 8:

$2X^4 1^4 -X^6 1^2 -X^2 1^6 = 0$ or $2X^4 -X^6 -X^2 = 0$

And once again X=1 is the natural number solution.

In general, a binomial expansion and cancellation leaves:

$(2X)^N$ = 2(+/- leftover terms) and so X=1 is the solution.

By intuition, any higher powers would result in the same balancing of +/- terms and a final result with X=1 the only real solution. So if N>2 there are no distinct natural number (A,B,C) solutions to Plato's formula.

So there is no A,B,C for N > 2 such that

$A^N + B^N = C^N$

■

QED

Here the proof is limited to triples with an even B and where C - A = 2.

What this exercise shows is that Plato's formula cannot. generalize to higher powers if it is limited to natural numbers.

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5th Trio: Fermat and Triples Again

Posted: Sep 2024

Euclid and Fermat again

By Michael Griffin, MLS

This is the fourth article about using ancient Greek formulas with Fermat's Last Theorem. It begins with the common introduction and part of the previous article about Euclid's formula:

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Although it has been solved by modern methods, Fermat's Last Theorem will continue to draw anyone curious as to a method Fermat himself might have used to solve it. To that end, a few idle investigations are reported here, with some conclusions that by no means make a rigorous proof. Call this an intuitive approach. I cannot even claim that this work has not.been previously done by others, as the first part of it was clearly accomplished by Euclid.

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Euclid is credited with a formula to generate all possible Pythagorean triples: for any natural numbers m and n, m>n, a triplet of (A,B,C) results from (m^2-n^2, 2mn, m^2+n^2).

For example, (m,n) of (2,1) makes (3,4,5), the first such triple, for 9+16=25.

Let us begin our intuitive proof by expanding Euclid's formula with an unfounded assumption that just because Euclid's formula applies to N=2 it should generalize to all powers. What this exercise will show is that it cannot.

So for $A^N + B^N = C^N$ we use $(m^N-n^N)^N + (2mn)^N = (m^N+n^N)^N$.

First, to see that $A^N + B^N = C^N$ has infinitely many solutions for N, look at the drawing below. The height of the curve C^N can be arbitrarily divided into any two parts that will satisfy $A^N + B^N$.

The question is now are there any values for m,n that will satisfy:

$A^N = (m^N-n^N)^N$ and $B^N = (2mn)^N$ and $C^N = (m^N+n^N)^N$.

The previous article showed that if we do a binomial expansion for any power of N and then cancel like terms on both sides of the equation what we will have remaining is

$B^N = (2mn)^N$ = 2(+/- leftover terms) and so m=n is the solution.

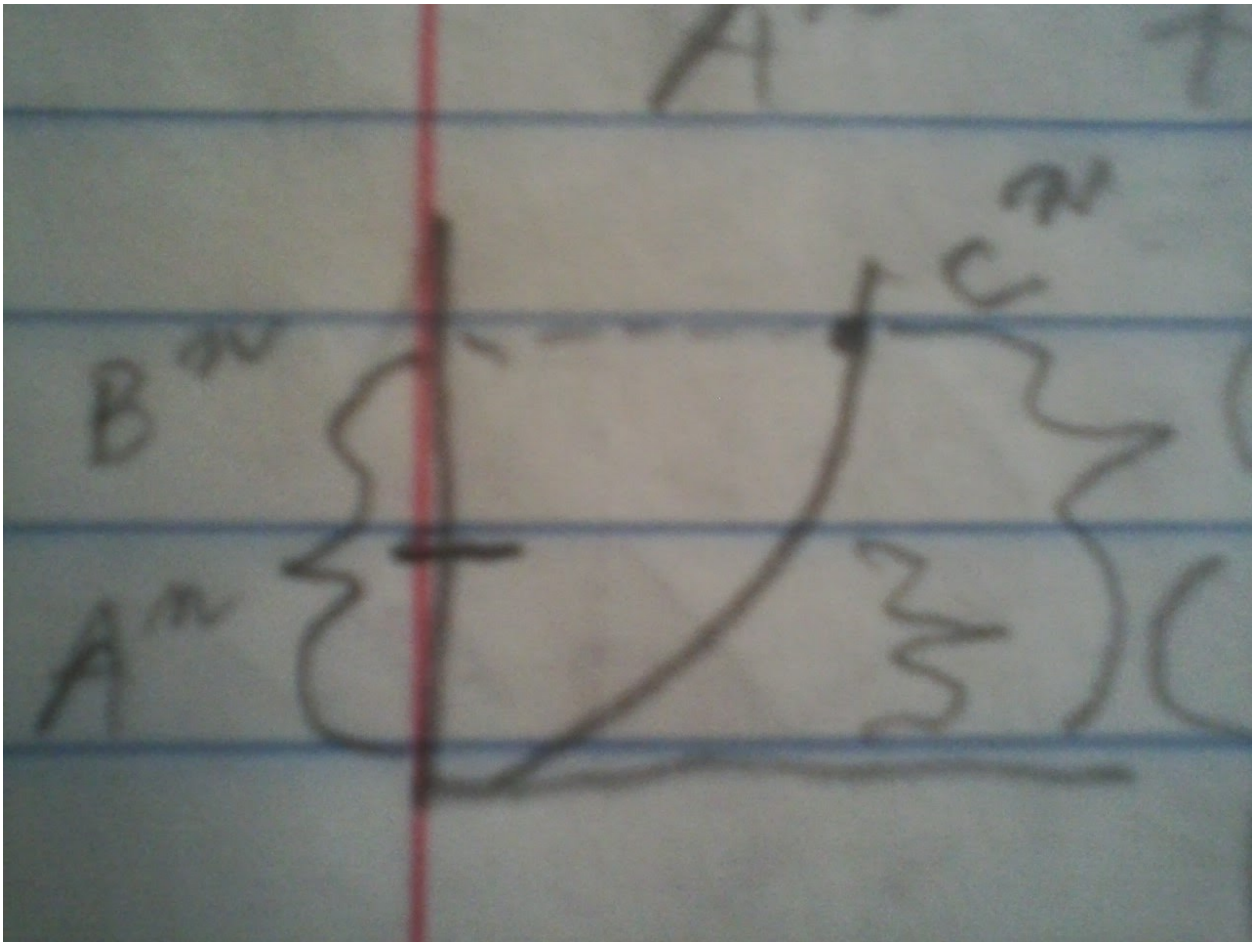
Putting this solution into Euclid's formula we see:

$A^N = (m^N - m^N)^N = 0$ and $B^N = (2mm)^N = (2m^2)^N$ and $C^N = (m^N + m^N)^N = (2m^N)^N$

So $0 + B^N = C^N$ or $(2m^2)^N = (2m^N)^N$ so $2^N m^{2N} = 2^N (m^N)^N$

Cancelling the 2^N on both sides leaves $m^{2N} = (m^N)^N$

And the only solution for the exponent is N = 2



So If we define A,B,C according to Euclid's formula, there is no A,B,C for N > 2 such that $A^N + B^N = C^N$

■

QED

So we see that altering Euclid's formula does not change the result when we still used the only solution of an invalid triple where the A term is zero.

We make an intuitive leap to conclude that if the Greek formulas comply with Fermat's, then the solution sets of these formulas will always comply also.

While these intuitive investigations have established Fermat's Last Theorem for all Pythagorean triples, that leaves out all other possible combinations of numbers, that is all ABC's that do not fit Euclid's formula. These would differ from Euclid's values as:

$A = m^2-n^2$ plus or minus 0, 1, 2, ...

$B = 2mn$ plus or minus 0, 1, 2, ...

$C = m^2+n^2$ plus or minus 0, 1, 2, ...

If we kept the same factoring of these according to Euclid's formula there would be extra bits resulting in

$B^N = (2mn)^N$ = 2(+/- leftover terms) plus or minus 1, 2, ... and so m=n is NOT the solution. Also since the ABC's do not fit Euclid's formula there is no solution for N = 2.

We'd be starting all over, with an infinite endless supply of unproved triples, minus the set of Pythagorean triples.

Does Euclid's formula cover all possible solutions? It does generate all Pythagorean triples if a K factor is put onto its formula for ABC. For example if K is equal to 2 then (3,4,5) and (5,12,13) become (6,8,10) and (10,24,26). And if

we interpret Euclid's derivation of his formula as a proof of all possible solutions for N=2 then in fact to prove Fermat's is it sufficient to show that Euclid's has no solutions beyond N=2? That has now been shown.

It would be sufficient if it could be shown that all solutions of $A^N + B^N = C^N$ must comply with Euclid's. That is easy for many if not all triples, so it is not enough. We can only pursue it as another possible proof just on the set of Pythagorean triples.

In general, if A,B,C,N,k,m,n are real numbers then m and n can always be chosen such that the Nth root $C = \sqrt[N]{(m^2-n^2)^N + (2mn)^N}$. There are infinitely many solutions in real numbers, just not integers or natural numbers. That is not necessary to comply with Euclid's formula. Restricting these to natural numbers results in Pythagorean triples. If N=2 the result for the Nth root C is Euclid's definition for the C term, m^2+n^2. If N is beyond 2 we do not get Euclid's C term and Fermat's Last Theorem means at least one of A,B,C is not an integer. How can we show that? The next post will discuss that.

Sources

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Pythagorean triple

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https://en.wikipedia.org/wiki/Pythagorean_triple#Special_cases_and_related_equations

Posted: Oct 2024

Euclid and Fermat yet again

By Michael Griffin, MLS

This is the fifth article about using ancient Greek formulas with Fermat's Last Theorem. It begins with parts of the previous articles about Euclid's formula:

.

In Fermat's problem:

$A^N + B^N = C^N$ has infinitely many solutions for N but the highest whole number solution is 2, as with the sides of a right triangle in the Pythagorean theorem: $A^2 + B^2 = C^2$

Euclid is credited with a formula to generate all possible Pythagorean triples: for any natural numbers k, m and n, m>n, a triplet of (A,B,C) results from $k(m^2-n^2, 2mn, m^2+n^2)$.

For example, k(m,n) of 1(2,1) makes (3,4,5), the first such triple, for 9+16=25.

Does Euclid's formula cover all possible solutions of Fermat's? It may not matter since it probably does not cover all possible triples anyway. Let's at least explore its root properties.

In general, if A,B,C,N,k,m,n are real numbers then m and n can always be chosen such that the Nth root $C = \sqrt[N]{(m^2-n^2)^N + (2mn)^N}$. While this may not cover all possible, there are infinitely many solutions in real numbers, just not integers or natural numbers. That is not necessary to comply with Euclid's formula. Restricting these to natural numbers results in Pythagorean triples. If N=2 the result for the Nth root C is Euclid's definition for the C term, m^2+n^2.

$\sqrt{(m^2-n^2)^2 + (2mn)^2} = \sqrt{(m^4-2m^2n^2+n^4)+ (4m^2n^2)} = \sqrt{(m^4+2m^2n^2+n^4)} = \sqrt{(m^2+n^2)^2}$

If N is beyond 2 we do not get Euclid's C term and Fermat's Last Theorem means at least one of A,B,C is not an integer. How can we show that?

Consider the nth roots where n is greater than 2. Higher roots would be smaller than the second root which is Euclid's m^2+n^2. Since they are the C term, higher roots are bigger than the A or B terms. On a number line the terms would arrange as A,B, nth root, Euclid's C. For the A and B terms to be natural numbers so must the m and n terms be.

So we are looking for the nth root C term not to be natural. It's possible domain on the number line goes from the B term to Euclid's C. Because the nth root is less than Euclid's C we can use some properties of Pythagorean triples. Previous articles discussed the three Greek formulas so we will make a case for each:

If Euclid's C fits Pythagoras' formula then C-B=1 and so the domain of the nth root is not large enough after B to make a natural number.

If Euclid's C fits Plato's formula then C-B=2 and so the domain of the nth root is not large enough after B to make a natural number except for B+1. In that case C-B=1 and we would have a Pythagorean triple for the second power.

If Euclid's C fits Euclid's formula, the domain of the nth root is less than C- B which is

$m^2+n^2 - 2mn$ which factors as $(m-n)^2$. Or if A is the larger term, the domain of the nth root is less than C-A which is $m^2+n^2 - (m^2-n^2)$ which is $2n^2$. For example, for m,n=5,2 then ABC=21,20,29 and the domain of the nth root is less than 8. We have room for natural numbers now, although we can make more restrictions.

Since the m and n terms must be natural numbers, so are the domains $(m-n)^2$ and $2n^2$, so the domain boundaries are only square numbers 1,4,9,16,25, … Higher roots of square numbers are usually not natural numbers. An exception example is like when 2 is the 4th root of 16. Of course the actual C term is below A or B plus 1,4,9,16,25, … and each A or B term is a natural perfect nth root of A^N or B^N. There can also be nth roots of combinations of natural numbers like $(B+X^2)$. For example, the third root of $(2+5^2) = (2+25) = 27$ is 3, a natural number. Euclid's formula is not concluding easily like the other Greek formulas. So this method is not as productive as the prior ways to show Fermat's on Pythagorean triples, using Euclid's formula.

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Posted: Nov 2024

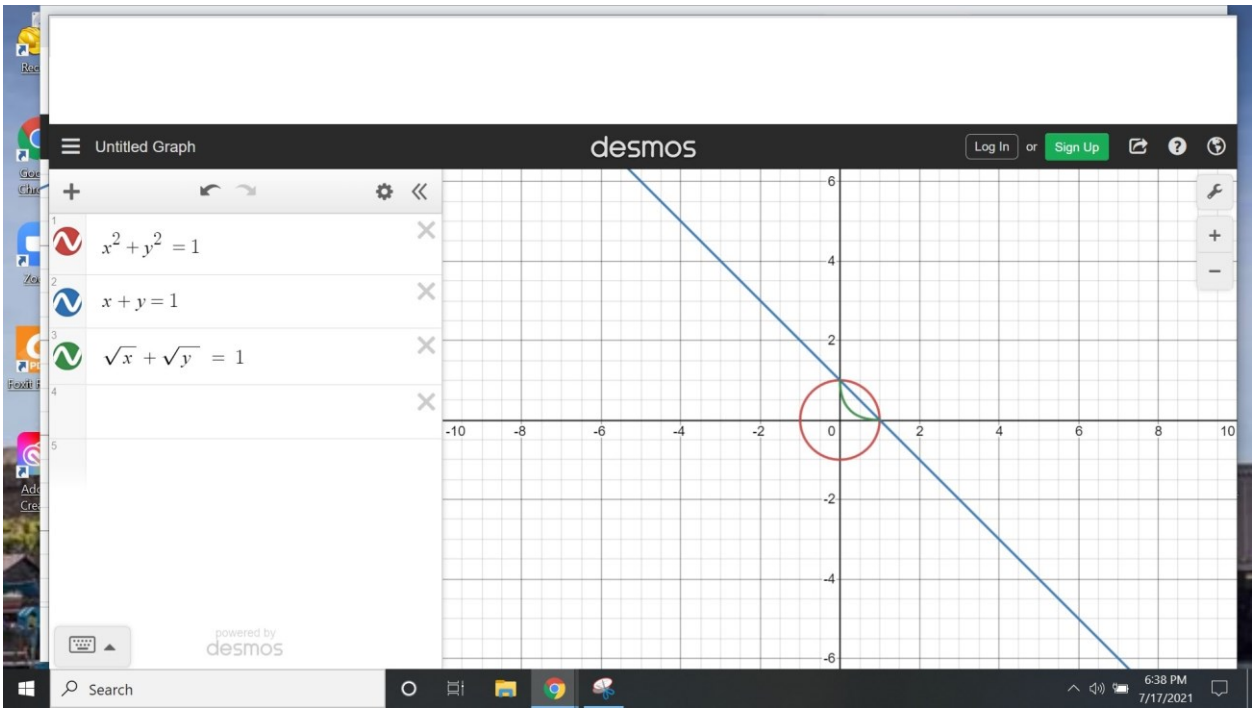
Epilogue: More Curves and Fermat

By Michael Griffin, MLS

An alternative statement of Fermat's theorem is that any solutions would have to have coordinates on the Desmos curves (shown in the Prologue) that could be converted into natural number triples.

This does happen on the unit circle for n = 2. Note the two coordinate points (0.6, 0.8) and (0.8, 0.6). As fractions these are (3/5, 4/5) and (4/5, 3/5) which convert into the triple 3 4 5.

Another result occurs below the baseline using fractional values of n. For example the square root is n = 1/2



Zooming into the first quadrant for this we can see that the point (0.25, 0.25) has a solution (0.5, 0.5) on the n = 1 baseline which would convert into the triple

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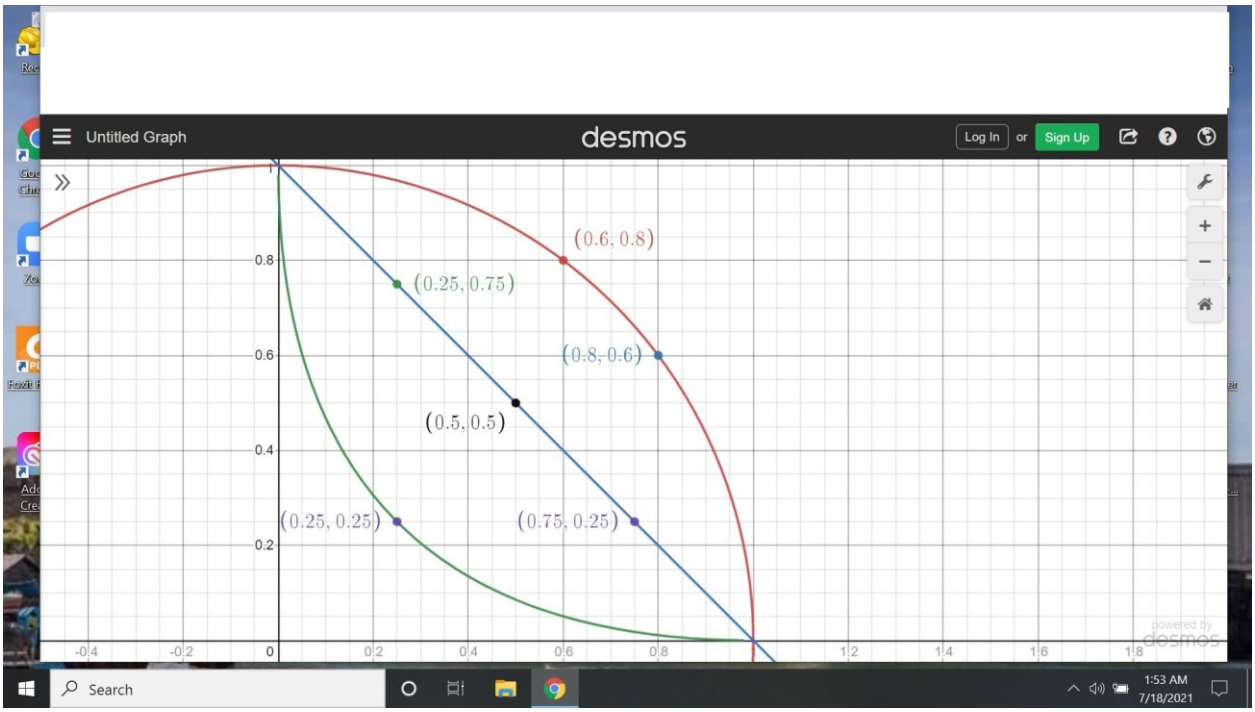

That is not quite fitting the rules since ABC are supposed to be distinct. The points on the baseline (0.25, 0.75) and (0.75, 0.25) would become distinct as 1 3 4 or 3 1 4. Still we might generalize Fermat's theorem as that any natural number solutions would fit the condition of $1/2 \leq n \leq 2$. Higher roots would have the same unsolvable problem as higher powers. Or at least intuitively they seem like they should. And the principle would hold that any convertible solution points on the square root curve would never occur on the higher roots curves. However, this is getting away from the blog posts which only dealt with natural numbered powers. All of these graphs simply serve as alternative proofs of that algebra.

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https://www.desmos.com/calculator

Single Field Speculation

Posted: Sep 2025

A Universe a Single Field Can Play In

By Michael Griffin, MLS

1. Development

A single UFT force

Let us recall that basic truth written as E=MC^2 or E equals MC squared.This is called the principle of mass-energy equivalence. Let's go beyond that and make it into a principle of equality. So how can energy and matter be two forms of the same thing? Since this article is merely speculation, a mathematical recreation, we will only occasionally be bound by the rigorous constraints of known physics. We can form a new interpretation of space-time (st) intended for compatibility with as many basic principles that fit. For classic unified field theory (UFT), we are concerned with the four basic forces of gravity, electromagnetism, nuclear binding, and radioactivity, to spin it into theory,

2. A Universe Needed

Covering the 4 forces

Each of these forces is illustrated by one idea. Gravity is represented by a planet in space. Nuclear binding and radioactivity are illustrated by in the nucleus of the atom, protons are bound together in spite of their repelling electric charges. The nucleus can also discharge particles or radiation, radioactivity, which would be going away from the nucleus.

An actual illustration of electromagnetism would have dotted lines to show the magnetic field. Electric current flow lines up electrons, or if a bar magnet has the electrons lined up in the same orientation, the effect is the same as current flow, to create a field. We could take the direction of current flow as fitting the “right hand rule” of a field curving around like fingers curled up behind the right hand’s pointing thumb.

3. Action Principles

Speed-field relation

Electromagnetism is also modeled as the electromagnetic wave spectrum, which also is modeled with particle properties. A particle of light is called the photon, typically considered as energy without mass. The constant speed of light, c, in all frames of reference led to the theory of special relativity. General relativity models the curvature of space and time by gravity from mass. One way it was

confirmed is by observing the bending of light rays near the sun. Massless photons with no field of their own are still affected by a gravity field just because space itself is curved. If something is mass, it can never reach the speed of light, according to relativity.

For our UFT substance, we will not make a sharp distinction between mass and energy. Instead, we will compare fields and particle speeds:

	Speed	Field range
Photon	c	0
Weak nuclear	?	10^-17m
Strong nuclear	?	10^-15m
Electromagnetic charge on a mass	Current flow	observable
Gravity mass	Inertia or g acceleration	interstellar

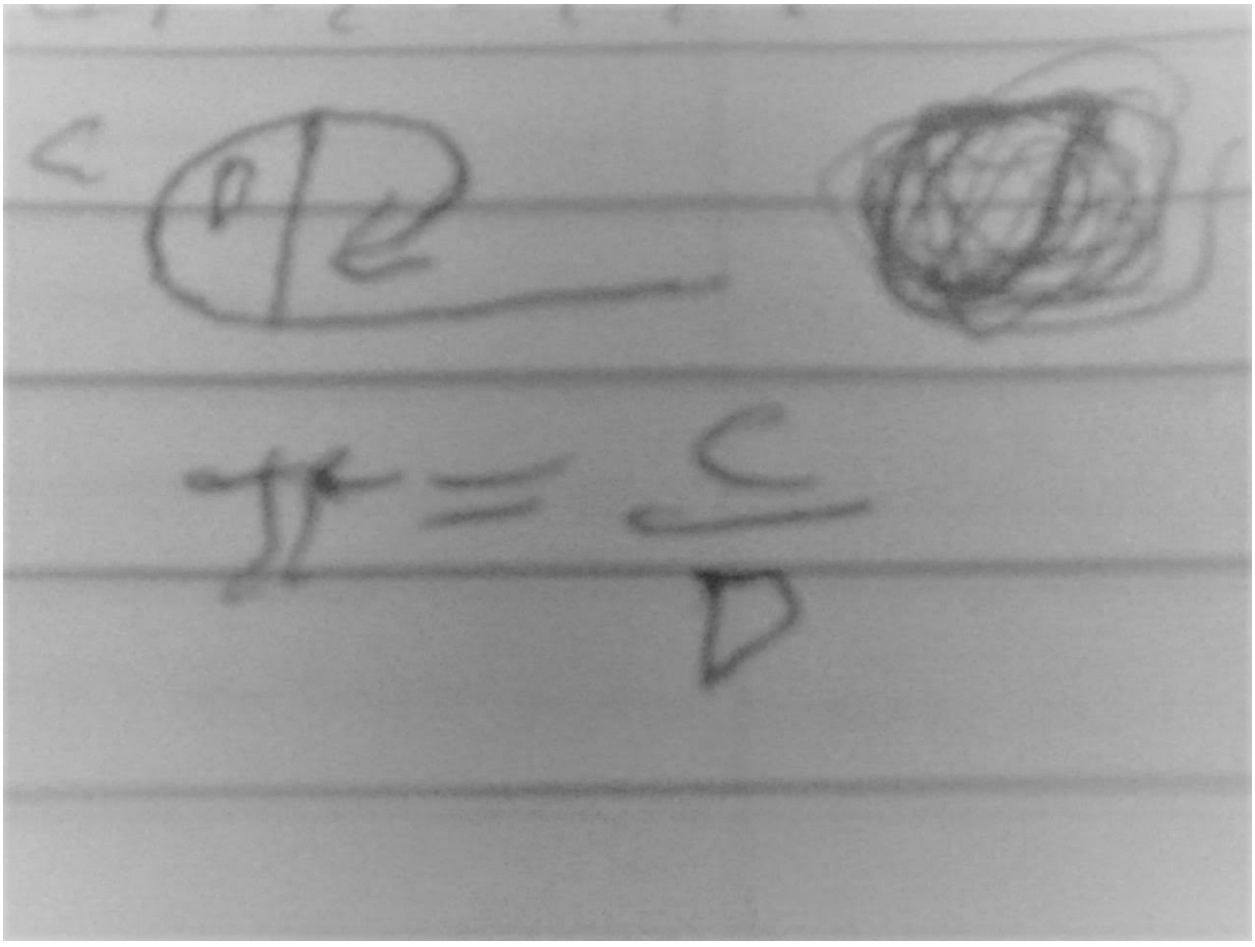
It seems there is an inverse relation between speed and field. A slower speed has a bigger field.

What is a field? Definition

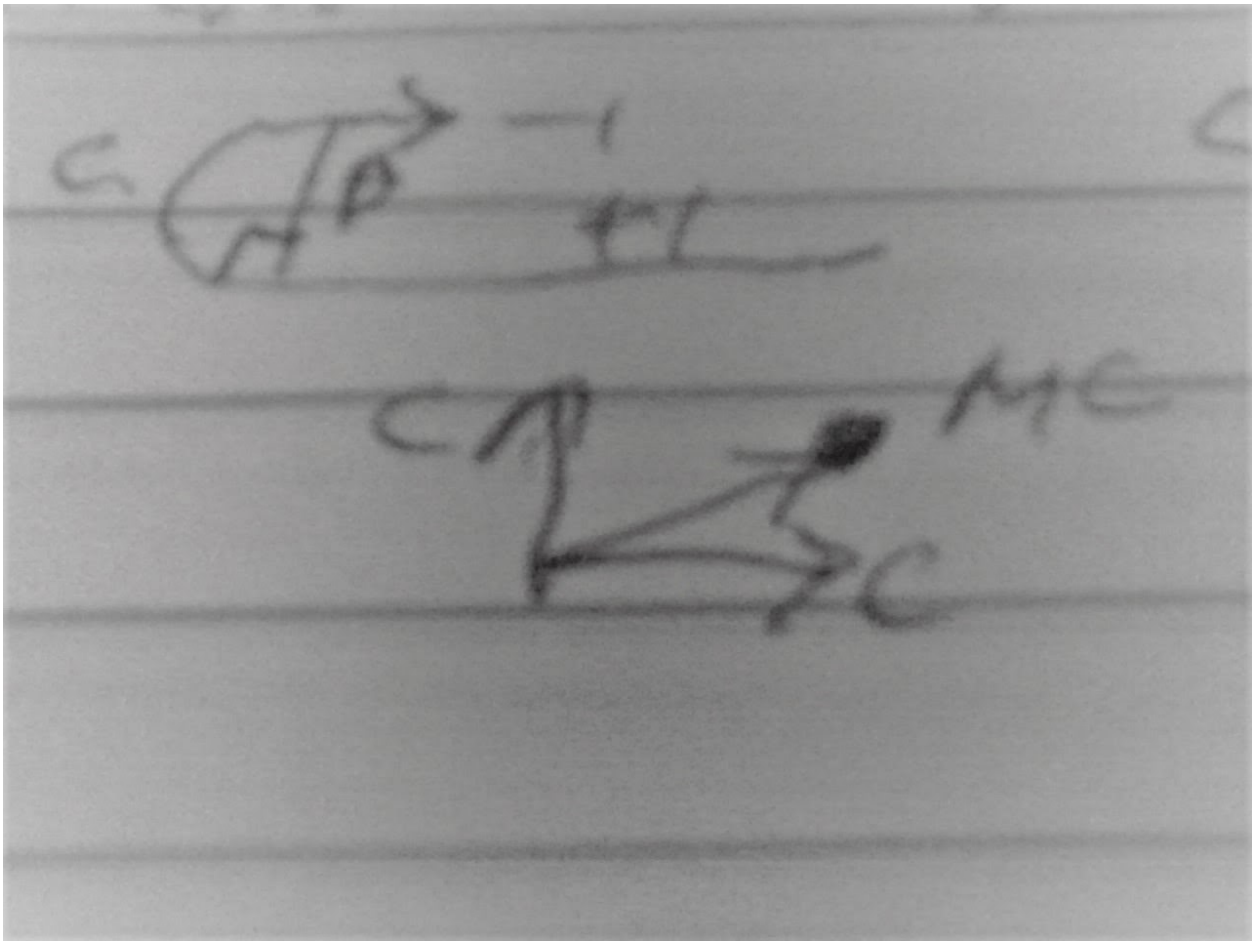
A field is an area where force or some other quality manifests. We will address the aspects of speed, range, intensity, force, and momentum to derive a UFT. Begin with E=MC^2 or E equals MC squared, or energy equals mass times the speed of light times the speed of light. This is a kind of statement of the ultimate potential energy in mass. Dividing both sides of the equation by the speed of light, we now have E/C=MC. This is a momentum field of mass times the speed of light. Here we depart from relativity theory because in real-world physics this is supposed to be impossible. So our UFT's mass M is not yet matter in the conventional sense. If it is really moving at the speed of light C then it is a photon. It can be modeled as an electromagnetic force, but it does not have the force fields of matter like gravity, binding, or radiation. It moves in a straight path as energy, whereas all the fields of matter would confine it to a local area. To become fielded as matter, it's straight line path must change.

Enfielding by Euler's

There is a mathematical symbol which is interpreted in physics to mean rotate 90°. It is the letter i which also stands for the square root of negative one, √-1. This is part of Euler's famous equation e to the pi i plus1 equals zero: e^(πi) + 1=0 or e^(πi) = -1. The symbol pi or π is defined as the ratio of the circumference to the diameter of a circle, and Euler's equation can be interpreted as a way to describe cyclical patterns. If a straight path photon of energy begins a 90° or 90-degree rotation from the diameter of the circle to move along the circumference we can say that it has become enfielded into matter.



This is one way to interpret the meaning of i. Another interpretation of Euler's equation is that e^ (xi) = cos(x) + isin(x). Which again would be the cosine wave in the real world plane and a sine wave in the 90-degree imaginary i-plane. However, when x is pi this cyclical wave motion is also just equal to -1 which could mean the opposite direction that a photon was moving in before it became enfielded and took an orbit at a right angle. So then Euler's equation would be a multiplying factor in the UFT formula.



This explains the how but not the why of enfielding. It would also explain the how of the reverse process of unfielding where a matter particle or wave stops harmonizing in it's self-contained area and resumes a straight path as a photon vibrating with its wave-like properties. Something of the why may be due to the +/- nature of the direction of the equation which was defined as one. When two UFT particles collide we will take that to be the final multiplication of their masses, and we will only consider the directional value of +/-1. Positive one has been defined as the path of a photon while -1 has been defined as the path of enfielded mass. A few basic possibilities exist:

-1 X -1 = +1 two masses collide and convert to photons,

-1 X 1 = -1 mass absorbs a photon,

1 X 1 = 1 photons collide and merge or remain photons.

Those would be the rules according to basic arithmetic. The other possibilities which would not conform to standard arithmetic are:

1 X 1 = -1 photons collide and emit a mass,

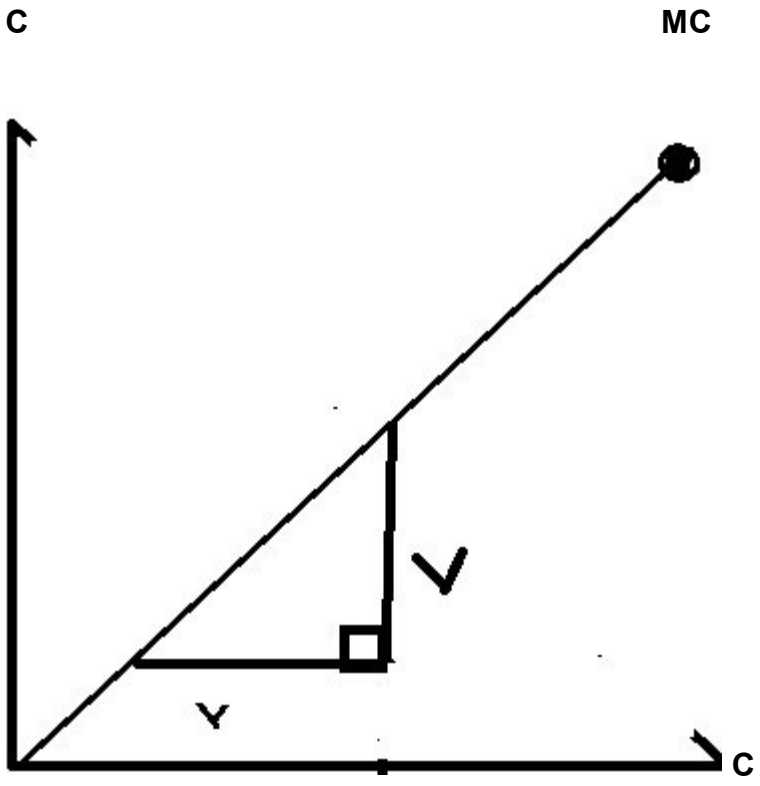
-1 X 1 = +1 mass absorbs a photon and converts to photon,

-1 X -1 = -1 two masses collide and remain mass.

For the UFT the basic rules can suffice. The other rules may apply if something else like the Euler field factor makes a better fit to reality.

Space-time (st) defined as MC

So our particle of UFT material has now become fielded mass and is no longer moving at the speed of light C. Then what was the meaning of a potential momentum field MC? This is the ultimate momentum from the ultimate energy that any mass can have. For conservation of energy, this is the structure of space-time. In any inertial frame of reference, a particle's total momentum is MC merely due to its existence in space-time. A Cartesian-like grid would have the X and Y axes represented each by a C vector, meaning the speed of light.


C
MC
V
Y
C

Note that area is two dimensions or C squared, as in E=MC^2. This can be interpreted as the three-dimensional aspects of the grid, and the two dimensional plane of C squared would be analogous to the curl of the field while one-dimensional vector momentum is analogous to the divergence of the field. MC is the space-time tension that any particle has. Left on its own, that particle can move along the grid as a photon or other energy particle.

What of the inverse relation between speed and field? A particle at slower speed has a bigger field. A ratio V/C that appears in relativity theory also makes sense to modify the momentum field E/C=MC since the momentum of physical objects is MV not MC. To maintain the original balance of the relation, we have E/(V/C) =MV/C. The left side of this equation will become bigger as the velocity becomes smaller. So we can call the ratio V/C a measure of the field intensity. Since our basic structure of space-time is MC, a measure of the range R of any field could be defined so that RV= C. Then range times intensity is R X ratio V/C = C/C = 1. A photon with velocity C has field intensity one to begin with, and a range of one, which would mean the diameter of the photon itself with an exterior field of zero. Since R = C/V there is now some justification for the traditional Infinity postulates of fields: as V approaches 0 the range factor approaches Infinity for that special frame of reference.

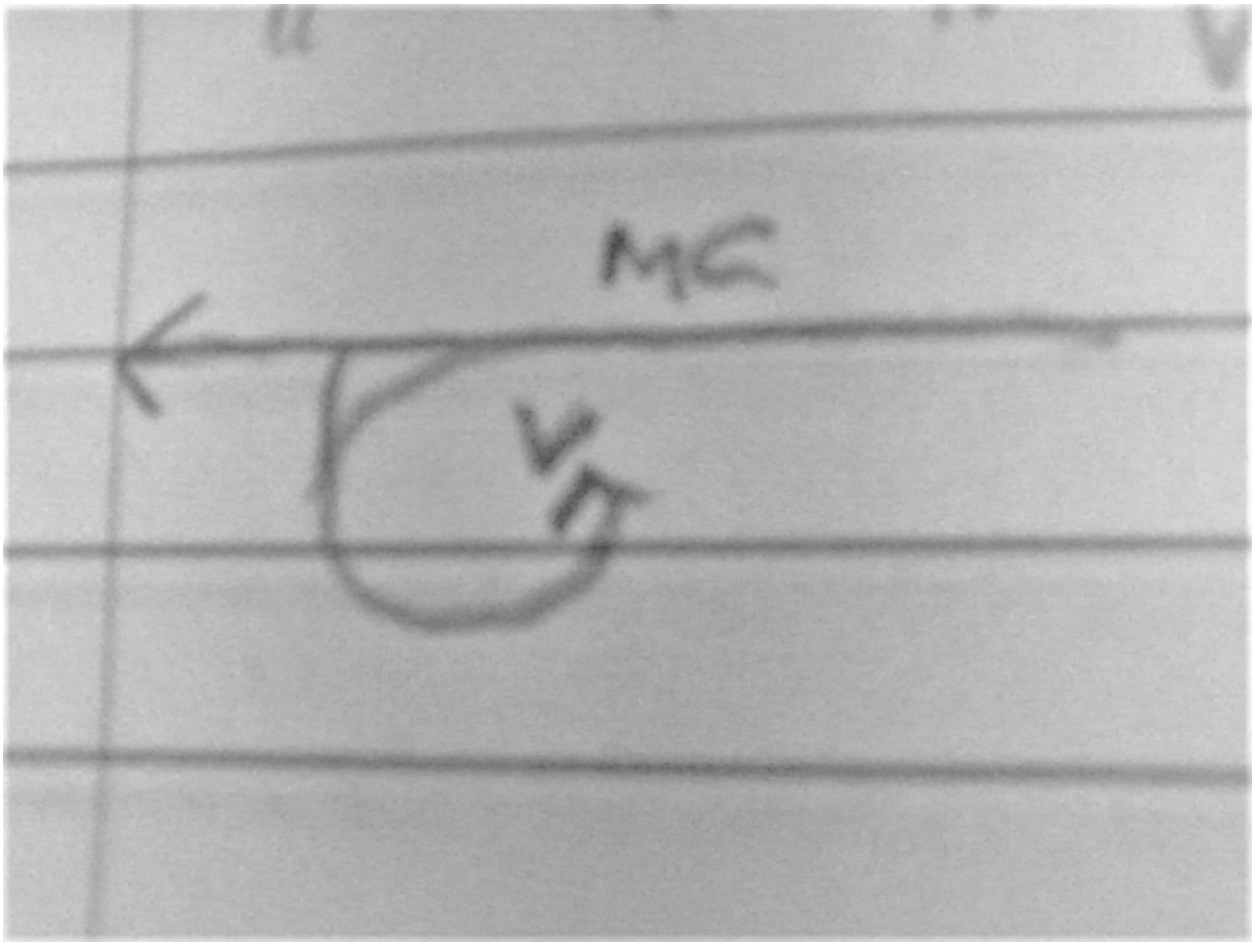
Look at the above diagram of the path of MC in a CXC grid. Using the Pythagorean theorem, break Its C vector into its right-angle velocity components v and V:

v^2 + V^2 = C^2 v^2 = C^2 - V^2 v^2/C^2 = C^2/C^2 - V^2/C^2

v^2/C^2 = 1 - V^2/C^2 so v/C = $\sqrt{}$(1 – V^2/C^2) and if Rv = C then

R = C/v

But C/v = 1/(v/C) which = 1/$\sqrt{}$(1 – V^2/C^2) which is the Lorentz transform factor (Ltf) so the range factor R of v = the Ltf of its co-component V. The velocity components v and V come from the enfielding of mass M into (st). Special relativity's Ltf is generated here by the mass distortion of (st).



4. A Universe Compared

Scale of forces

The following table is from a standard textbook cited in the sources:

Force	relative strength	range
Strong nuclear	1	10^-15m
Electromagnetic	10^-12	oo
Weak nuclear	10^-14	10^-17m
Gravitation	10^-40	oo

Gravity thus 1/100

The table uses the Strong nuclear force as a unit of one since it is the strongest. The relative strengths of the other forces in the table are compared to that. One implication from the table is that gravity is also not really an infinite range. We see that gravity is less than the strong force by a factor of 10 to the -40 power. If there is an inverse relation between speed and field, then it may also show up between strength and range. We may thus conclude that the range of a gravity field is greater than a strong field by the factor of 10 to the 40th power. Multiplying these two factors means that we combine the exponents to get the range of a gravity field as: 10^-15m X 10^40 = 10^25 meters.

We can compare this result to the known size of the universe, 8.8 X 10^26 meters. Rounding this up to 10^27m we see that the universe is about 10^2 or 100 times bigger than the extent of a single gravity field. Our galaxy is said to be only 5X10^20m across, which is well contained within any single gravity field. A galaxy may only affect 1/100 of the rest of the universe, with its gravity. This may explain so many astronomical observations which at present do not fit any theories.

So in the table, both gravity and electromagnetism carry a definition that their ranges are infinite. I would call this an infinity postulate. In the UFT there is a new infinity postulate that the space-time tension of a particle everywhere is MC. The old infinity postulate is not used. Unfortunately, our formula for the range of field based on velocity does not give an easy answer for gravity's field as 10^25 meters. For example, a single g of earth acceleration due to gravity for one second is about 10 m/s. The speed of light C is 3×10^8 m/s. From that, the gravity range of an earth particle would be only 10^7 m. If we multiplied masses in Newton's formula, perhaps we could add exponents to get 10^14. Now the gravitational constant G has a power of 10^-11. If this were inverted and the exponent was added, then we would get 10^25 meters.

Spin cycles for field strength

If we subtract exponents in the above table we see that electromagnetism is 10 to the 28th power stronger than gravity, or 10^28. The two forces have different

inverse square laws, one based on charge Q and the other based on mass M. Our UFT field should only have a single inverse square law. Besides that law, it also has the new Euler factor e^(nπi) where the exponent n pi i allows for many cyclical waves or spins represented by the letter n. If each enfielded mass has its own Euler factor and two masses multiply in such an inverse square, then at the very least it would be e^(2πi) which would revert to a direction of +1 if it were still photons, but it is not. Instead for two enfielded masses the system has them spinning or cycling at some value of e^(nπi).

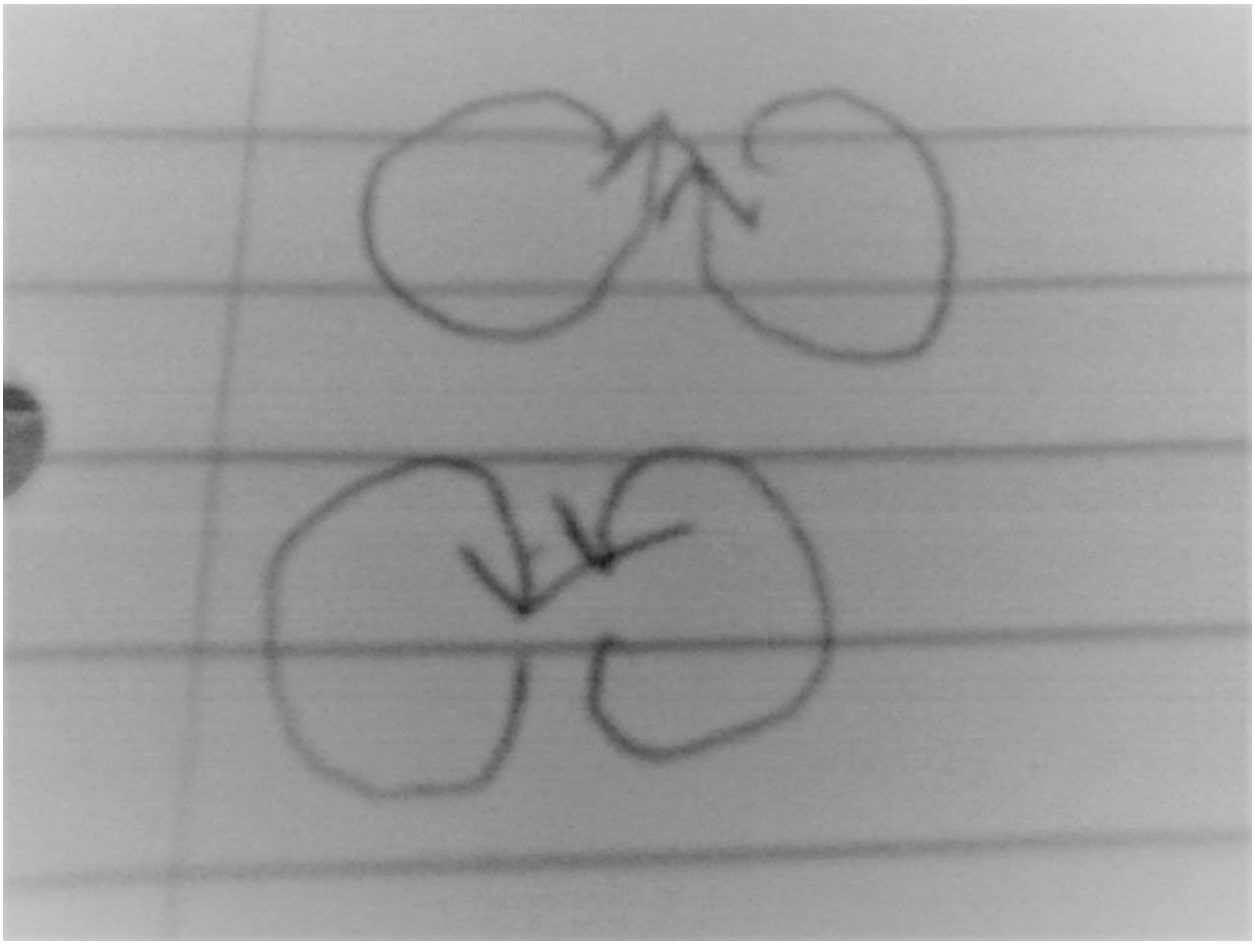
The value of n may be the only difference in field strengths. For comparison, let us say that n equals 1 for the gravity field G and we don't know the value of n for the electromagnetic field Q. We do know that the ratio or fraction Q/G equals 10^28. All other field formulas in the fraction have canceled out leaving only:

e^(nπi) / e^(πi) = 10^28. This simplifies to e^((n-1)πi) = 10^28. Solving for n we get:

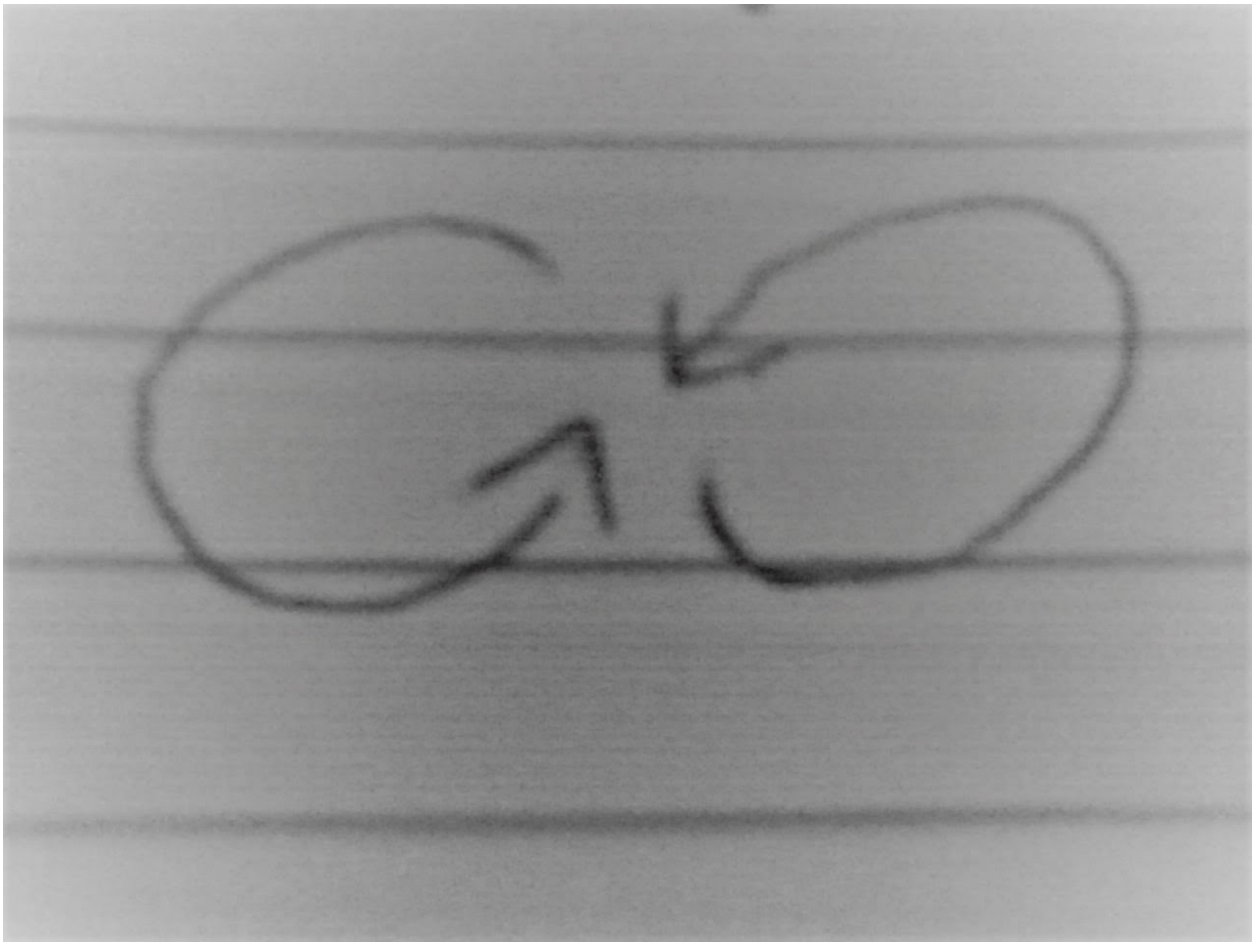
n = (28 ln10) / (πi) + 1 as how many more cycles or spins the enfielded particle had to make to go from gravity to electromagnetic strength. In this context if we treat the i as just one then the value of n is 21.522 or 21 and a half spins. Similar calculation results for strong and weak forces will appear in a table below.

Inertia, where is +/- always

The value of n may also determine where is a +/- polarity in the UFT field, which is always seen in Q but never recognized in gravity's G. Consider two curves extended into complete circles side by side: a OO pattern. This could represent the spinning (st) cycles of two enfielded masses. General relativity would make this out to be the (st) funnels of mass without any spin. By spin I refer to the n value of the Euler field factor. If the spins are in the same direction they have the same sign whether +/+ or -/-.



If the spins are in the opposite direction they have different signs whether +/- or -/+, and the circular paths will come around to go through the middle of the OO shape in the same direction. This is opposite signs attracting in (st). If the spins are in the same direction and get out of sync the paths will collide in the middle of the OO, opposing each other in reverse direction. This is repulsion of the same signs whether +/+ or -/-.



The question remains, where is repulsion with the force of gravity? All around us we see everything attracted with gravity as if everything has opposite +/- polarities. Part of the answer may be in an anthropic principle: If the anti-gravity were not already gone we would not be here to notice. There are suggestions that galaxies are separating at an accelerating rate, and this would clearly be due to repulsion of their net gravitational fields. The cosmological constant of general relativity may then be an index of anti-gravity repulsion.

On an everyday level, where else could anti-gravity repulsion show up? Modeling gravitational motion occurs in two dimensions, one in the direction of attraction and the other at an inertial right angle. lnertia is plain velocity not acceleration so it is a momentum not a force. The momentum that keeps two masses moving away from each other or towards each other as the case may be. Maybe sometimes inertia is from the force of repulsion. ln a broader inertial frame of reference where special relativity would apply, but too local for general relativity, anti-gravity only happens on a gravity scale. ln a UFT there is only one kind of repulsion: when n values get out of sync.

Quantum unit basis

One way to get a real value of n is to use quantum theory and Planck's constant h. Combining E=hF and E=MC^2 makes MC^2=hF which gives the frequency F=

MC^2/h for a matter wave. If we put in the numbers for the reduced constant h and the Planck mass then we get:

2.18X10^-8 (3X10^8)^2 / 1.05X10^-34 = 18.6857X10^42 = 1.8X10^43

This is the Planck frequency in Hz for the upper bound of electromagnetic or cosmic rays. Since this is the highest possible frequency, it can represent the strongest force of nuclear binding.

To be consistent with the Heisenberg uncertainty principle, the smallest spin radius should be the Planck length when we interpret the uncertainty principle as angular momentum.

Radioactivity-binding +/-

The next table will show the relative spin-cycle n values for each force and also their characteristic electromagnetic spectrum frequencies:

Force	Magnitude	Frequency Hz	Relative n
strong	1	10^43	30.317
electromagnetic	10^-12	10^31	21.522
weak	10^-14	10^29	20.056
gravity	10^-40	10^3	1

The characteristic frequencies for electromagnetic and weak force are both in the high gamma range. Since gamma rays are part of radioactivity emissions this is not surprising for the weak force. It is more surprising that it would be the basis of charge Q. Gravity does give a good fit merely by subtracting exponents, though of course gravity waves are not considered electromagnetic waves.

We can now fill in the missing velocities in our first table above for the strong and weak nuclear forces. Use the field definition of range times velocity equals c, or R X V = C. For the strong nuclear force, its range is 10^-15m while the speed of light C is 3 X 10^8 m/sec. V would have to be 10^23 for the exponents to work, which is impossible for a single particle, but we have two particles multiplying in the inverse-square relation. As was done with the gravity example above, we will also consider the gravitational constant with its exponential power of 10^11. So from an exponent of 23 we subtract 11 and then divide by 2 leaving 23-11 = 12 / 2 = 6 for the exponent. So the revealed mass particle velocity in a field of nuclear binding strength is 10^6 m/sec.

Similarly for the weak nuclear force, its range is 10^-17m. To get a light speed C value of 10^8 m/sec, V would have to be 10^25 for the exponents to work. Again we subtract the gravitational constant's power and divide the result by 2 since two particles are multiplying their fields together. 25-11 = 14 / 2 = 7 so the revealed particle velocity involved in the weak force is 10^7 m/sec. Weak forces

emit particles and gamma rays, so regardless of electromagnetic charge there is still a repulsion occurring due to out-of-sync spin-cycle values of n.

The usual way binding force is thought of, is so the binding force is assumed to overcome the like-charge repulsion of protons. If there is only a single binding inverse-square force then this is no longer the case. However, if experiment does show that such amounts of energy are involved in the nucleus then it makes sense to keep these relative magnitudes of forces to make the tables for this UFT.

Conservation

To help clarify the difference between spin-n-values in the table and Hertz frequencies I will make an analogy as the child's toy of a spinning top on the ground, only instead of the typical wooden top with a metal post let us imagine it as a hollow plastic top. Of course the spinning of the top is the space-time spin of enfielding which continues as long as it has mass in the traditional sense. As it spins it is also moving along the ground In some kind of path, and this is the inertial velocity of a fielded mass. Within the hollow plastic top there could be waves or particles vibrating around, and these would be the characteristic wave functions of electromagnetic photons or larger mass particles, in either case what could be called a wavicle. We do not want to violate relativity, so from any point of view the total velocity should never exceed the speed of light. This leads to a conservation of velocity principle implicating the speed of light:

$\sum v=c$ Or the sum of all velocities adds up to the speed of light C.

If this were so, then we might find some further relations between the quantum equation and the Euler field factor:

E = nHf = MC^2 = M(inertial v + frequency f + spin speed of N)^2

Here N is part of the exponent of the Euler factor e^(nπi) where, once fielded by e^(πi), any further rotation by N spins makes the vortex effect in (st) to give field strength and matching to any of the drawings presented in this paper. The analogy then would not be like current flow in water since hydrodynamics does not support such a direct multiplication of force. A better analogy would be like a fishing line reel that increases tension as it is wound up.

5. Conclusions

This mathematical recreation is based upon a strong equality principle. The simplicity of it does have some notable differences from standard interpretations which can be summarized here:

1. Mass is totally conserved in this system, transforming unfielded energy into matter. Of course in relativity theory mass increases with velocity. Such complications would have prevented working out the basic geometry.
2. Unfielded mass moving at light speed is the basis of space-time. This does not have to conflict with a wave particle duality.

3. Fields are not infinite by assumption, having a range based on velocity and fitting the Lorentz transform factor. At small velocities fields would appear infinite.
4. Euler's identity is the invisible missing field factor which would be placed next to the inverse-square part of a field equation. If the spin value is zero, mass is not fielded.
5. Since this is a single field, different forces are not overcome by the interaction of fields. The relative spin between any two fielded masses decides the intensity. Forces are replaced in transition, not overcome.

These are the main differences from usual approaches to making a UFT. A final question for this system is whether or not there are only four n-spin values as shown in the table. Perhaps there is a range of values making a spectrum of field strengths. In nature we observe four discrete effects which have led to field models limited to those effects. Maybe we will start noticing more effects. Here our speculation is at an end.

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Brooks/Cole, 2002 - Sixth edition - 553 pages

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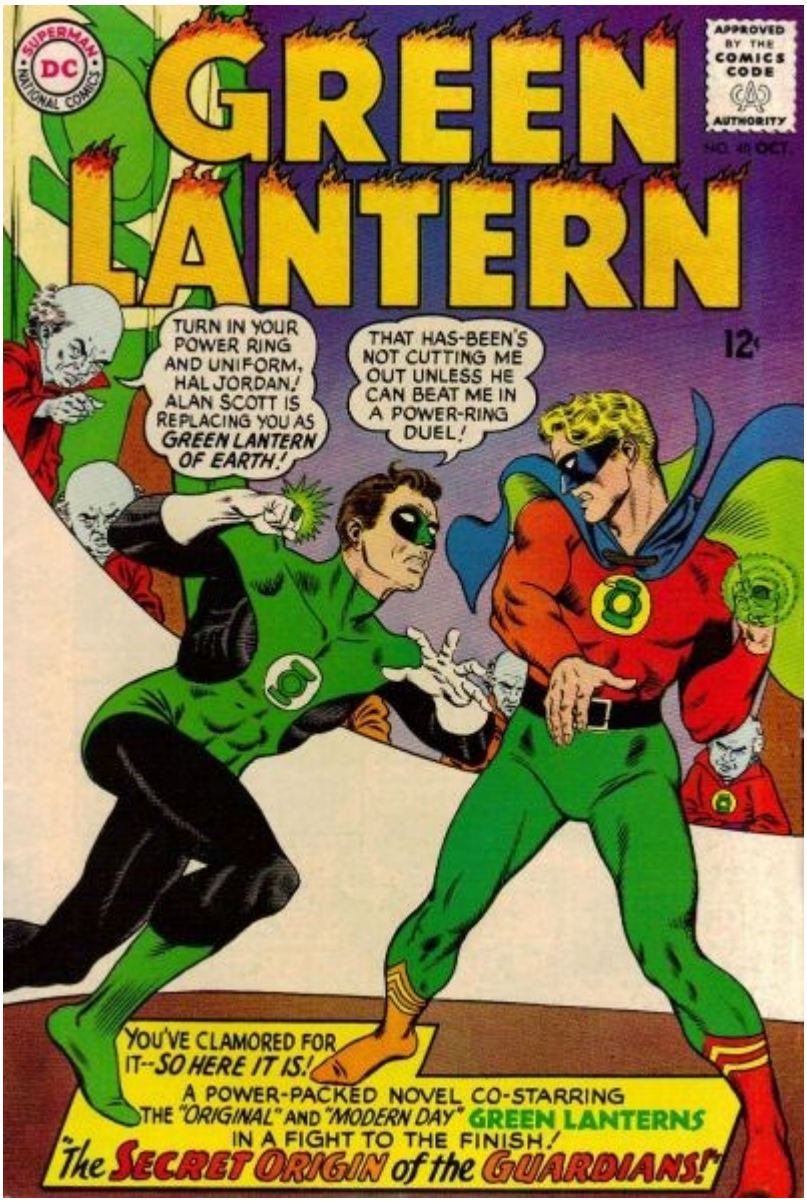
6th Trio: Comic Book Versions

Posted: Sep 2026

A Universe Green Lanterns Can Play In

By Michael Griffin, ML Fringe



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1. Development of Green Lanterns

From the article “Magic Ring” in Wikipedia, the free encyclopedia:

“In the DC Universe, the members of the Green Lantern Corps wear power rings that have a scientific, not magical, basis. These rings allow the bearer to perform any feat he can imagine, but are limited by his willpower. The Blackest Night storyline reveals the existence of similar rings of other colors, powered by other emotions such as greed and hope. The original Green Lantern, Alan Scott fashions a power ring from an ancient lamp that is a concentration of magic energy that the Guardians of the Universe created in an attempt to remove magic from the universe. As a result of this discovery, Scott's ring functions much like the standard Green Lantern rings, except that it cannot directly affect wood.”

Besides Alan Scott, the most well-known Green Lantern since 1959 is Hal Jordan, pictured above on the left and below flying through the vacuum of space. The green vapor trail around Jordan is an example of how the power ring can create things. .

Another example of the green material emanating from the power ring is shown by this cover:

2. A Universe Needed

A single UFT force for the ring

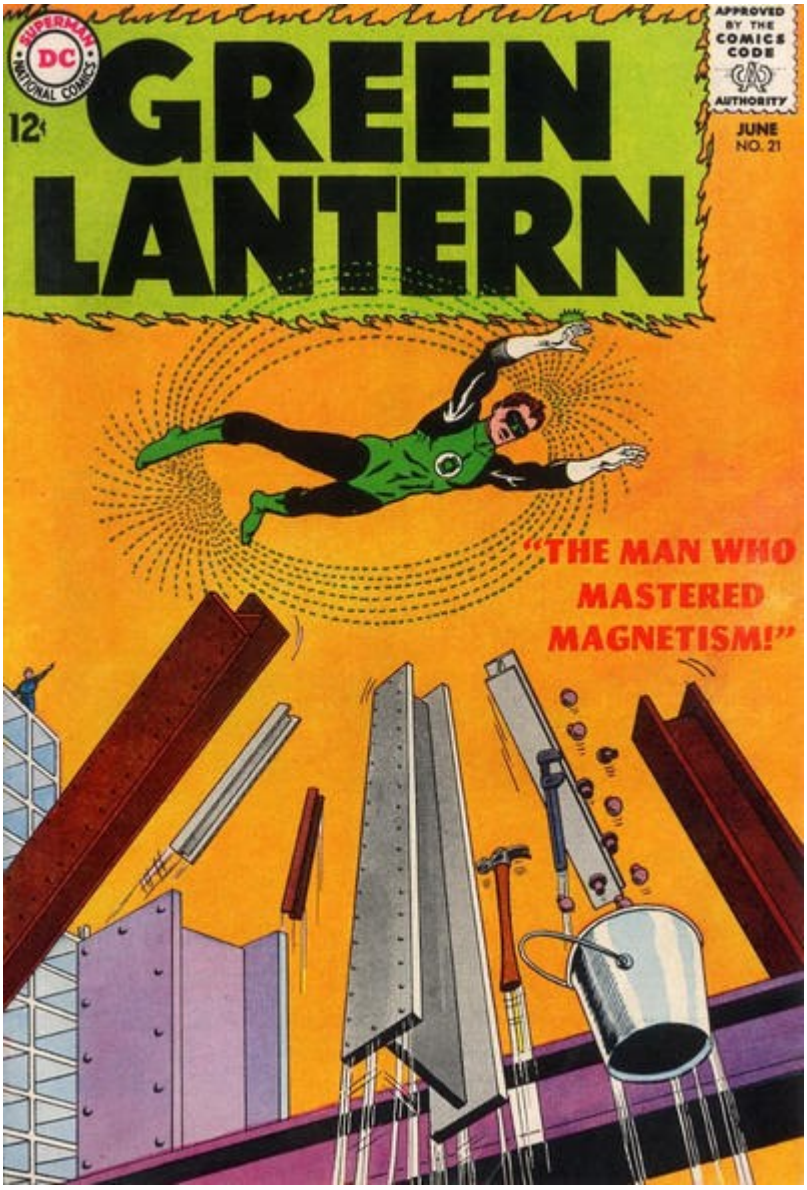
What is the green will-goo? To spin it into theory, it must be a solid single substance, not matter or atoms, a unified material that can act as solid force yet move as if just light speed of pure energy, speed of thought. Thus, we need a single, pure force field of matter that can easily shift into energy. The will of thought shapes it while its power comes from the ring's charge. The ring is recharged from a lamp-battery as shown in the cover below. The ring and lamp

use a single energy that can store as a charge. It reshapes at the will of thought into forces of matter. So how can energy and matter be two forms of the same thing? Let us recall that basic truth written as $E=MC^2$ or E equals MC squared. Since this article is merely comic book speculation, we are not bound by the rigorous mathematical constraints of known physics. We can form a new interpretation of space-time (st) intended for compatibility with as many basic principles that fit.

Covers show the 4 forces

For classic unified field theory (UFT), we are concerned with the four basic forces of gravity, electromagnetism, nuclear binding, and radioactivity. Each of these forces is illustrated by one of the covers shown. Gravity is represented by the cover of issue 24 above with a planet in space. Nuclear binding and radioactivity are illustrated by the next cover. In the nucleus of the atom, protons are bound together in spite of their repelling electric charges, as Hal Jordan's ring is stuck to the power battery. The nucleus can also discharge particles or radiation, radioactivity, which we represent by the jagged lightning bolt from Sinestro's ring to the battery, though the radiation would be going away from the battery.

The next cover is an actual illustration of electromagnetism with dotted lines to show the magnetic field. Electric current flow lines up electrons, or if a bar magnet has the electrons lined up in the same orientation, the effect is the same as current flow, to create a field as shown in the next cover. We could take the direction of the steel girders as one of current flow fitting the “right hand rule” of a field curving around like fingers curled up behind the right hand’s pointing thumb.



3. Action Principles

Speed-field relation

Electromagnetism is also modeled as the electromagnetic wave spectrum, which also is modeled with particle properties. A particle of light is called the photon, typically considered as energy without mass. The constant speed of light, c, in all

frames of reference led to the theory of special relativity. General relativity models the curvature of space and time by gravity from mass. One way it was confirmed is by observing the bending of light rays near the sun. Massless photons with no field of their own are still affected by a gravity field just because space itself is curved. If something is mass, it can never reach the speed of light, according to relativity.

For our Green Lantern substance, we will not make a sharp distinction between mass and energy. Instead, we will compare fields and particle speeds:

	Speed	Field range
Photon	c	0
Weak nuclear	?	10^-17m
Strong nuclear	?	10^-15m
Electromagnetic charge on a mass	Current flow	observable
Gravity mass	Inertia or g acceleration	interstellar

It seems there is an inverse relation between speed and field. A slower speed has a bigger field.

What is a field? Definition

A field is an area where force or some other quality manifests. We will address the aspects of speed, range, intensity, force, and momentum to derive a Green Lantern UFT. Begin with $E=MC^2$ or E equals MC squared, or energy equals mass times the speed of light times the speed of light. This is a kind of statement of the ultimate potential energy in mass. Dividing both sides of the equation by the speed of light, we now have E/C=MC. This is a momentum field of mass times the speed of light. Here we depart from relativity theory because in real-world physics this is supposed to be impossible. So our Green Lantern's mass M is not yet matter in the conventional sense. If it is really moving at the speed of light C then it is a photon. It can be modeled as an electromagnetic force, but it does not

have the force fields of matter like gravity, binding, or radiation. It moves in a straight path as energy, whereas all the fields of matter would confine it to a local area. To become fielded as matter, it's straight line path must change.

Enfielding by Euler's

There is a mathematical symbol which is interpreted in physics to mean rotate 90°. It is the letter i which also stands for the square root of negative one, $\sqrt{-1}$. This is part of Euler's famous equation e to the pi-i plus1 equals zero: $e^{\pi i}+1=0$ or $e^{\pi i}=-1$. The symbol pi or π is defined as the ratio of the circumference to the diameter of a circle, and Euler's equation can be interpreted as a way to describe cyclical patterns. If a straight path photon of energy begins a 90° or 90-degree rotation from the diameter of the circle to move along the circumference we can say that it has become enfielded into matter.

This is one way to interpret the meaning of i. Another interpretation of Euler's equation is that $e^{xi} = \cos(x) + i\sin(x)$. Which again would be the cosine wave in the real world plane and a sine wave in the 90-degree imaginary i-plane. However, when x is pi this cyclical wave motion is also just equal to -1 which could mean the opposite direction that a photon was moving in before it became enfielded and took an orbit at a right angle. So then Euler's equation would be a multiplying factor in the UFT formula.

This explains the how but not the why of enfielding. It would also explain the how of the reverse process of unfielding where a matter particle or wave stops harmonizing in it's self-contained area and resumes a straight path as a photon vibrating with its wave-like properties. Something of the why may be due to the +/- nature of the direction of the equation which was defined as one. When two Green Lantern particles collide we will take that to be the final multiplication of their masses, and we will only consider the directional value of +/-1. Positive one has been defined as the path of a photon while -1 has been defined as the path of enfielded mass. A few basic possibilities exist:

-1 X -1 = +1 two masses collide and convert to photons,

-1 X 1 = -1 mass absorbs a photon,

1 X 1 = 1 photons collide and merge or remain photons.

Those would be the rules according to basic arithmetic. The other possibilities which would not conform to standard arithmetic are:

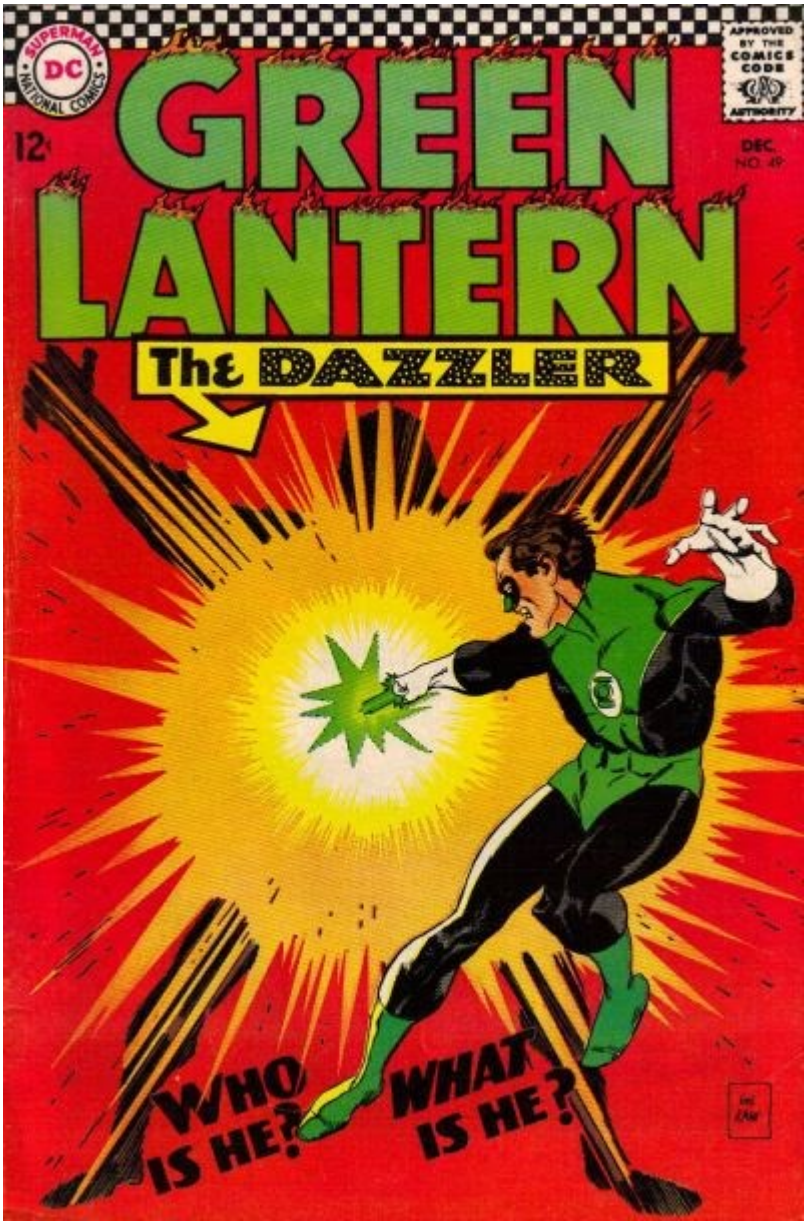
1 X 1 = -1 photons collide and emit a mass,

-1 X 1 = +1 mass absorbs a photon and converts to photon,

-1 X -1 = -1 two masses collide and remain mass.

Space-time (st) defined as MC

So our particle of Green Lantern material has now become fielded mass and is no longer moving at the speed of light C. Then what was the meaning of a potential momentum field MC? This is the ultimate momentum from the ultimate energy that any mass can have. For conservation of energy, this is the structure of space-time. In any inertial frame of reference, a particle's total momentum is MC merely due to its existence in space-time. A Cartesian grid would have the X and Y axes represented each by a C vector, meaning the speed of light. Note that area is two dimensions or C squared, as in $E=MC^2$.This can be interpreted as the three-dimensional aspects of the grid, and the two dimensional plane of C squared would be analogous to the curl of the field while one-dimensional vector momentum is analogous to the divergence of the field. MC is the space-time tension that any particle has. Left on its own, that particle can move along the grid as a photon or other energy particle. The next cover gives some idea of how this can be visualized.



What of the inverse relation between speed and field? A particle at slower speed has a bigger field. A ratio V/C that appears in relativity theory also makes sense to modify the momentum field E/C=MC since the momentum of physical objects is MV not MC. To maintain the original balance of the relation, we have E/(V/C) =MV/C. The left side of this equation will become bigger as the velocity becomes smaller. So we can call the ratio V/C a measure of the field intensity. Since our basic structure of space-time is MC, a measure of the range R of any field could be defined so that RV= C. Then range times intensity is R X ratio V/C = C/C = 1.

A photon with velocity C has field intensity one to begin with, and a range of one, which would mean the diameter of the photon itself with an exterior field of zero.

4. A Universe Compared

Scale of forces

The following table is from a standard textbook cited in the sources:

Force	relative strength	range
Strong nuclear	1	10^-15m
Electromagnetic	10^-12	oo
Weak nuclear	10^-14	10^-17m
Gravitation	10^-40	oo

Gravity thus 1/100

The table uses the Strong nuclear force as a unit of one since it is the strongest. The relative strengths of the other forces in the table are compared to that. One implication from the table is that gravity is also not really an infinite range. We see that gravity is less than the strong force by a factor of 10 to the -40 power. If there is an inverse relation between speed and field, then it may also show up between strength and range. We may thus conclude that the range of a gravity field is greater than a strong field by the factor of 10 to the 40th power. Multiplying these two factors means that we combine the exponents to get the range of a gravity field as: 10^-15m X 10^40 = 10^25 meters.

We can compare this result to the known size of the universe, 8.8 X 10^26 meters. Rounding this up to 10^27m we see that the universe is about 10^2 or 100 times bigger than the extent of a single gravity field. Our galaxy is said to be only 5X10^20m across, which is well contained within any single gravity field. A galaxy may only affect 1/100 of the rest of the universe, with its gravity. This may explain so many astronomical observations which at present do not fit any theories.

So in the table, both gravity and electromagnetism carry a definition that their ranges are infinite. I would call this an infinity postulate. In the Green Lantern UFT there is a new infinity postulate that the space-time tension of a particle everywhere is MC. The old infinity postulate is not used. Unfortunately, our formula for the range of field based on velocity does not give an easy answer for gravity's field as 10^25 meters. For example, a single g of earth acceleration due to gravity for one second is about 10 m/s. The speed of light C is 3×10^8 m/s. From that, the gravity range of an earth particle would be only 10^7 m. If we multiplied masses in Newton's formula, perhaps we could add exponents to get 10^14. Now the gravitational constant G has a power of 10^-11. If this were inverted and the exponent was added, then we would get 10^25 meters.

Spin cycles for field strength

If we subtract exponents in the above table we see that electromagnetism is 10 to the 28th power stronger than gravity, or 10^{28}. The two forces have different inverse square laws, one based on charge Q and the other based on mass M. Our Green Lantern field should only have a single inverse square law. Besides that law, it also has the new Euler factor e^{ni} where the exponent n pi i allows for many cyclical waves or spins represented by the letter n. The value of n may be the only difference in field strengths. For comparison, let us say that n equals 1 for the gravity field G and we don't know the value of n for the electromagnetic field Q. We do know that the ratio or fraction Q/G equals 10^{28}. All other field formulas in the fraction have canceled out leaving only:

$e^{ni} / e^{i} = 10^{28}$. This simplifies to $e^{(n-1)i} = 10^{28}$. Solving for n we get:

n = (28ln10)/(i)+1 as how many more cycles or spins the enfielded particle had to make to go from gravity to electromagnetic strength. In this context if we treat the i as just one then the value of n is 21.522 or 21 and a half spins. Similar calculation results for strong and weak forces will appear in a table below.

Inertia, where is +/- always

The value of n may also determine where is a +/- polarity in the Green Lantern field, which is always seen in Q but never recognized in gravity's G. Consider the above cover for Green Lantern issue 123 with its curving lines showing Hal's flight against gravity. Instead of a sideways S pattern, imagine the two curves extended into complete circles side by side: a OO pattern. This could represent

the spinning (st) cycles of two enfielded masses. General relativity would make this out to be the (st) funnel of mass without any spin. By spin I refer to the n value of the Euler field factor. If the spins are in the same direction they have the same sign whether +/+ or -/-. If the spins are in the opposite direction they have different signs whether +/- or -/+, and the circular paths will come around to go through the middle of the OO shape in the same direction. This is opposite signs attracting in (st). If the spins are in the same direction and get out of sync the paths will collide in the middle of the OO, opposing each other in reverse direction. This is repulsion of the same signs whether +/+ or -/-.

The question remains, where is repulsion with the force of gravity? All around us we see everything attracted with gravity as if everything has opposite +/- polarities. Part of the answer may be in an anthropic principle: If the anti-gravity were not already gone we would not be here to notice. There are suggestions that galaxies are separating at an accelerating rate, and this would clearly be due to repulsion of their net gravitational fields. The cosmological constant of general relativity may then be an index of anti-gravity repulsion. On an everyday level, where else could anti-gravity repulsion show up? Modeling gravitational motion occurs in two dimensions, one in the direction of attraction and the other at an inertial right angle. Inertia is plain velocity not acceleration so it is a momentum not a force. The momentum that keeps two masses moving away from each other or towards each other as the case may be. Maybe sometimes inertia is from the force of repulsion. In a broader inertial frame of reference where special relativity would apply, but too local for general relativity, anti-gravity only happens on a gravity scale. In a Green Lantern UFT there is only one kind of repulsion: when n values get out of sync.

Quantum unit basis

One way to get a real value of n is to use quantum theory and Planck's constant h. Combining E=hF and E=MC^2 makes MC^2=hF which gives the frequency F= MC^2/h for a matter wave. If we put in the numbers for the reduced constant h and the Planck mass then we get:

2.18X10^-8 (3X10^8)^2/1.05X10^-34 = 18.6857X10^42 = 1.8X10^43

This is the Planck frequency in Hz for the upper bound of electromagnetic or cosmic rays. Since this is the highest possible frequency, it can represent the strongest force of nuclear binding.

Radioactivity-binding +/-

The next table will show the relative spin-cycle n values for each force and also their characteristic electromagnetic spectrum frequencies:

Force	Magnitude	Frequency Hz	Relative n
strong	1	10^43	29.317
electromagnetic	10^-12	10^31	21.522
weak	10^-14	10^29	19.056
gravity	10^-40	10^3	1

The characteristic frequencies for electromagnetic and weak force are both in the high gamma range. Since gamma rays are part of radioactivity emissions this is not surprising for the weak force. It is more surprising that it would be the basis of charge Q. Gravity does give a good fit merely by subtracting exponents, though of course gravity waves are not considered electromagnetic waves.

We can now fill in the missing velocities in our first table above for the strong and weak nuclear forces. Use the field definition of range times velocity equals c, or R X V = C. For the strong nuclear force, its range is 10^-15m while the speed of light C is 3 X 10^8m/sec. V would have to be 10^23 for the exponents to work, which is impossible for a single particle, but we have two particles multiplying in the inverse-square relation. As was done with the gravity example above, we will also consider the gravitational constant with its exponential power of 10^11. So from an exponent of 23 we subtract 11 and then divide by 2 leaving 23-11=12/2=6 for the exponent. So the revealed mass particle velocity in a field of nuclear binding strength is 10^6m/sec.

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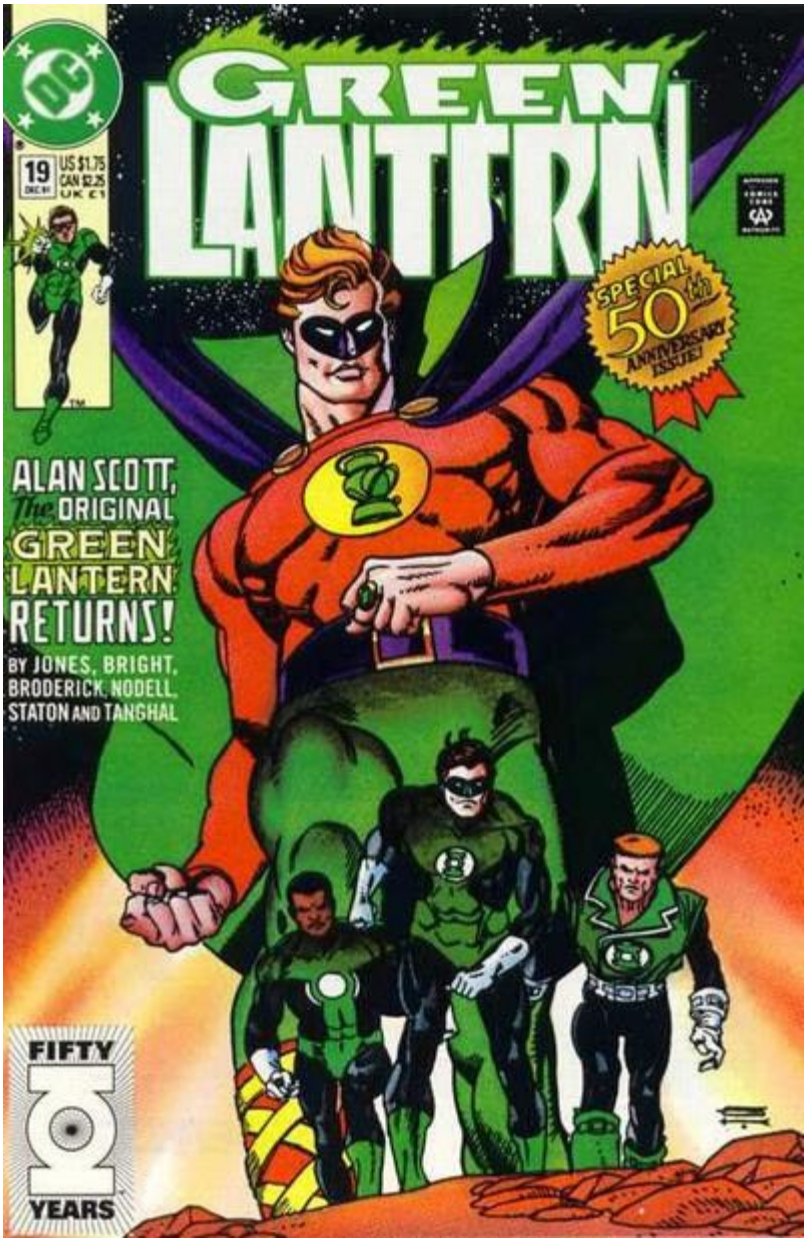
The above cover to Green Lantern issue 47 shows the usual way binding force is thought of. As Hal Jordan is stuck to the magnet by the superior force of Doctor Polaris, so the binding force is assumed to overcome the like-charge repulsion of protons. If there is only a single binding inverse-square force then this is no longer the case.However, if experiment does show that such amounts of energy are involved in the nucleus then it makes sense to keep these relative magnitudes of forces to make the tables for this Green Lantern UFT. The next

cover for Green Lantern issue 19 can represent the atomic model with Alan Scott as the nucleus binding force upon his fellow Green Lanterns.



Here our comic book speculation is at an end, and we still do not have a mechanism for how the Green Lantern's will power can influence the field.

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This page was last edited on 11 April 2019,

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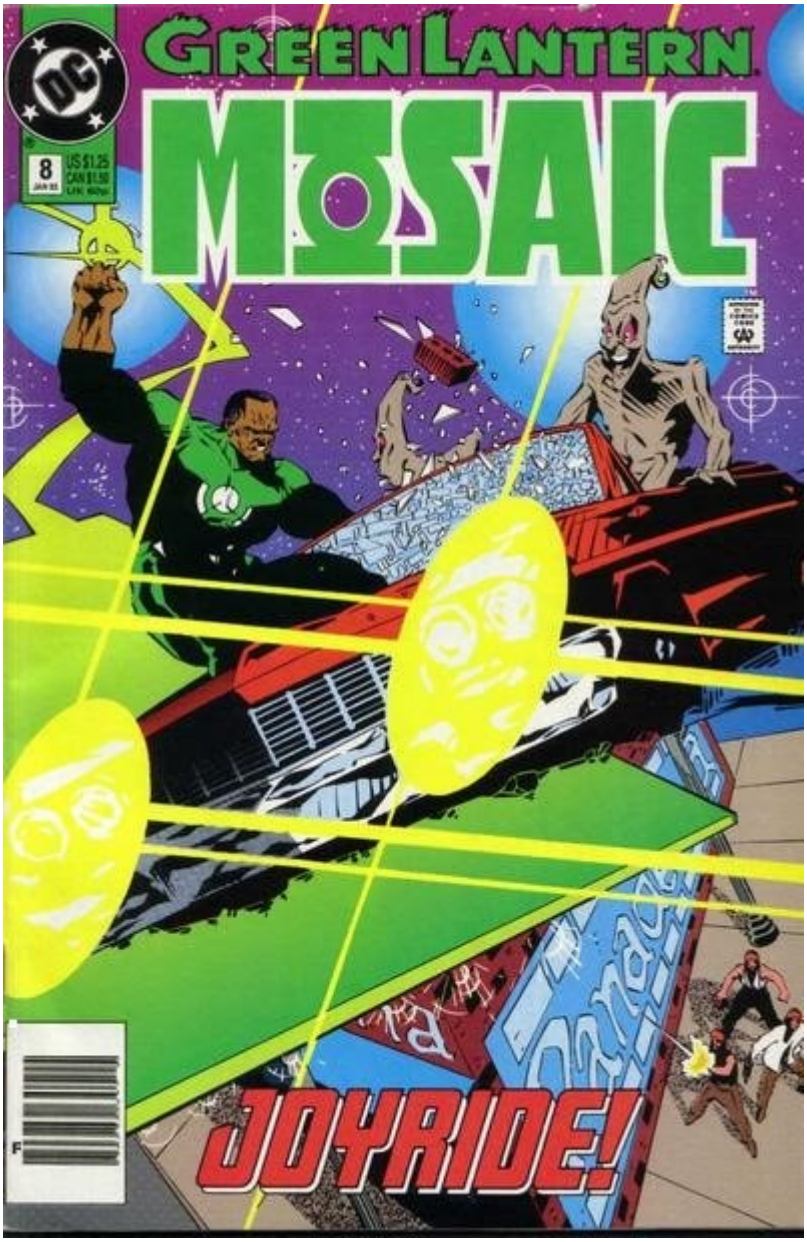
The most well-known Green Lantern since 1959 is Hal Jordan, pictured below in 1979 flying through the vacuum of space.The green vapor trail behind Jordan is an example of how the power ring can create things.

Another example of the green material emanating from the power ring is shown by this 1993 cover with the Green Lantern John Stewart:



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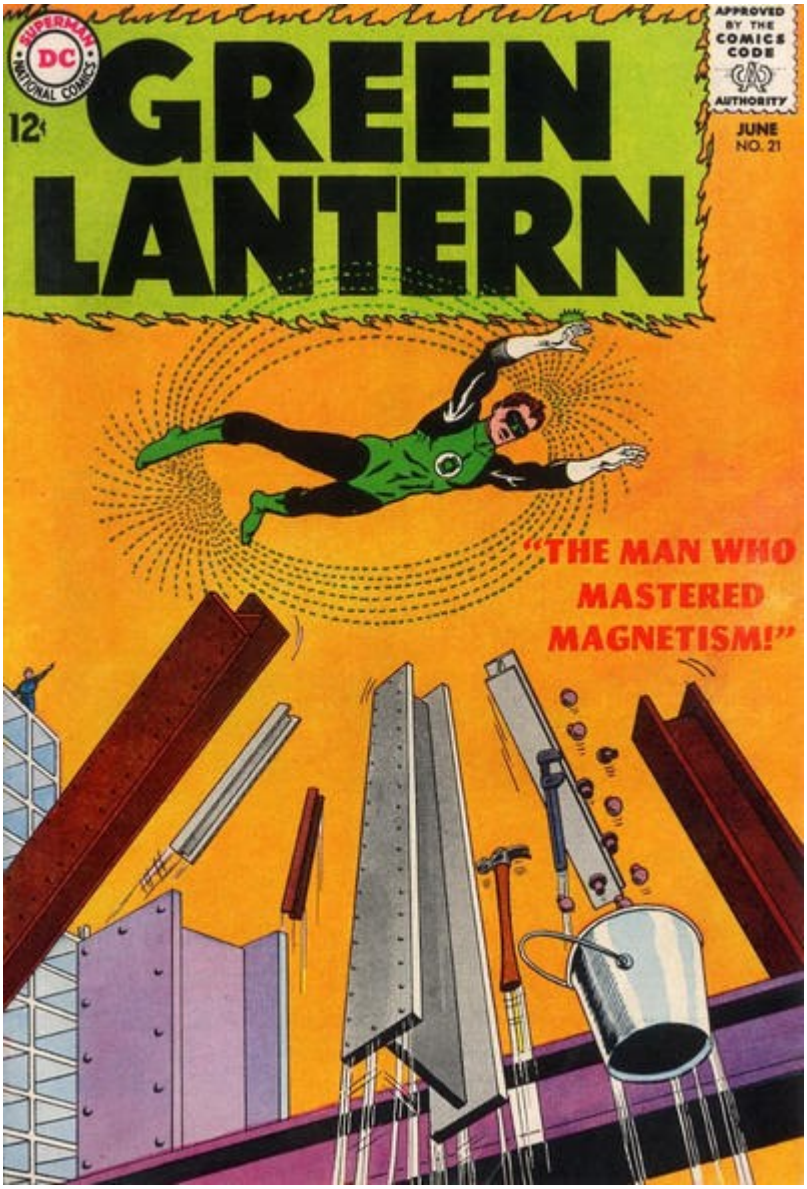

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Enfielding by Euler's

There is a mathematical symbol which is interpreted in physics to mean rotate 90°. It is the letter i which also stands for the square root of negative one, √-1. This is part of Euler's famous equation e to the pi i plus1 equals zero: e^(πi) + 1=0 or e^(πi) = -1. The symbol pi or π is defined as the ratio of the circumference to the diameter of a circle, and Euler's equation can be interpreted as a way to describe cyclical patterns. If a straight path photon of energy begins a 90° or 90-degree rotation from the diameter of the circle to move along the circumference we can say that it has become enfielded into matter.

This is one way to interpret the meaning of i. Another interpretation of Euler's equation is that e^ (xi) = cos(x) + isin(x). Which again would be the cosine wave in the real world plane and a sine wave in the 90-degree imaginary i-plane. However, when x is pi this cyclical wave motion is also just equal to -1 which could mean the opposite direction that a photon was moving in before it became enfielded and took an orbit at a right angle. So then Euler's equation would be a multiplying factor in the UFT formula.

This explains the how but not the why of enfielding. It would also explain the how of the reverse process of unfielding where a matter particle or wave stops harmonizing in it's self-contained area and resumes a straight path as a photon vibrating with its wave-like properties. Something of the why may be due to the +/- nature of the direction of the equation which was defined as one. When two Green Lantern particles collide we will take that to be the final multiplication of their masses, and we will only consider the directional value of +/-1. Positive one has been defined as the path of a photon while -1 has been defined as the path of enfielded mass. A few basic possibilities exist:

-1 X -1 = +1 two masses collide and convert to photons,

-1 X 1 = -1 mass absorbs a photon,

1 X 1 = 1 photons collide and merge or remain photons.

Those would be the rules according to basic arithmetic. The other possibilities which would not conform to standard arithmetic are:

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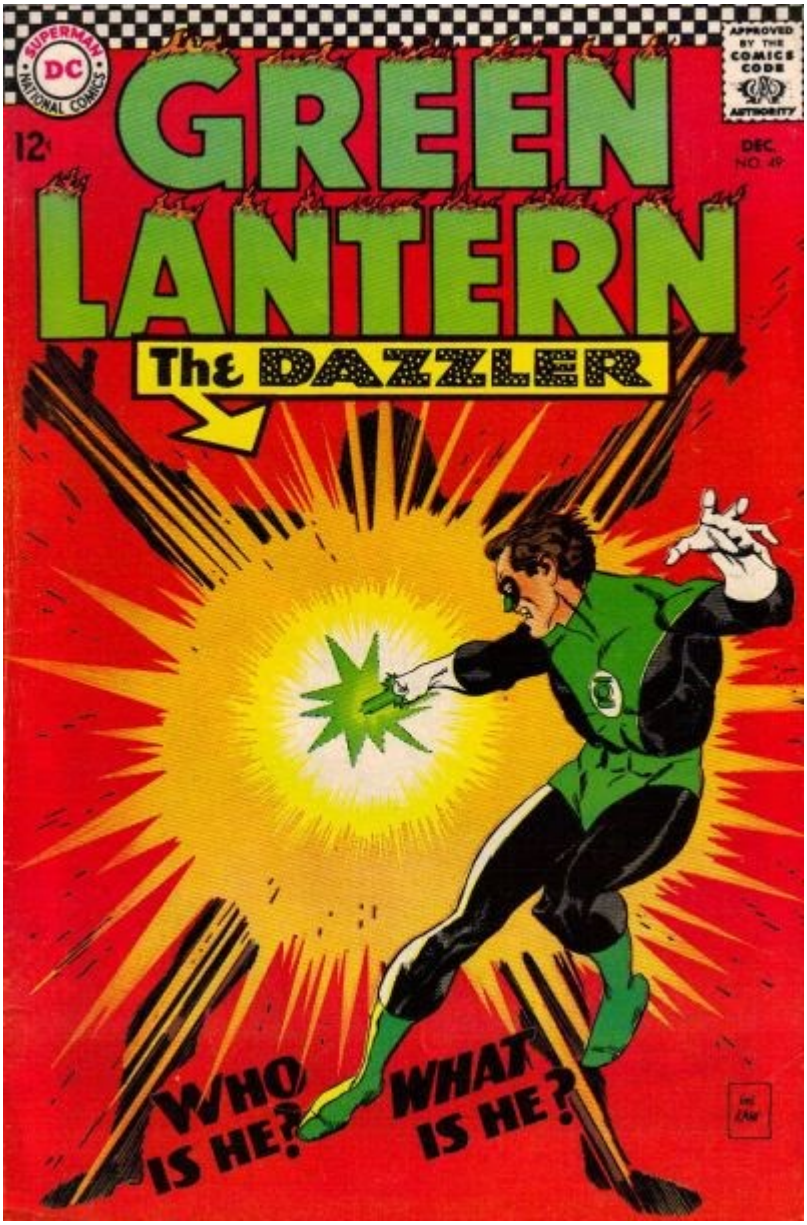
-1 X 1 = +1 mass absorbs a photon and converts to photon,

-1 X -1 = -1 two masses collide and remain mass.

For the Green Lantern UFT the basic rules can suffice. The other rules may apply if something else like the Euler field factor makes a better fit to reality.

Space-time (st) defined as MC

So our particle of Green Lantern material has now become fielded mass and is no longer moving at the speed of light C. Then what was the meaning of a potential momentum field MC? This is the ultimate momentum from the ultimate energy that any mass can have. For conservation of energy, this is the structure of space-time. In any inertial frame of reference, a particle's total momentum is MC merely due to its existence in space-time. A Cartesian-like grid would have the X and Y axes represented each by a C vector, meaning the speed of light. Note that area is two dimensions or C squared, as in E=MC^2. This can be interpreted as the three-dimensional aspects of the grid, and the two dimensional plane of C squared would be analogous to the curl of the field while one-dimensional vector momentum is analogous to the divergence of the field. MC is the space-time tension that any particle has. Left on its own, that particle can move along the grid as a photon or other energy particle. The next cover from 1966 gives some idea of how this can be visualized.



What of the inverse relation between speed and field? A particle at slower speed has a bigger field. A ratio V/C that appears in relativity theory also makes sense to modify the momentum field E/C=MC since the momentum of physical objects is MV not MC. To maintain the original balance of the relation, we have E/(V/C) =MV/C. The left side of this equation will become bigger as the velocity becomes smaller. So we can call the ratio V/C a measure of the field intensity. Since our basic structure of space-time is MC, a measure of the range R of any field could be defined so that RV= C. Then range times intensity is R X ratio V/C = C/C = 1. A photon with velocity C has field intensity one to begin with, and a range of one, which would mean the diameter of the photon itself with an exterior field of zero.

4. A Universe Compared

Scale of forces

The following table is from a standard textbook cited in the sources:

Force	relative strength	range
Strong nuclear	1	10^-15m
Electromagnetic	10^-12	oo
Weak nuclear	10^-14	10^-17m
Gravitation	10^-40	oo

Gravity thus 1/100

The table uses the Strong nuclear force as a unit of one since it is the strongest. The relative strengths of the other forces in the table are compared to that. One implication from the table is that gravity is also not really an infinite range. We see that gravity is less than the strong force by a factor of 10 to the -40 power. If there is an inverse relation between speed and field, then it may also show up between strength and range. We may thus conclude that the range of a gravity field is greater than a strong field by the factor of 10 to the 40th power. Multiplying these two factors means that we combine the exponents to get the range of a gravity field as: 10^-15m X 10^40 = 10^25 meters.

We can compare this result to the known size of the universe, 8.8 X 10^26 meters. Rounding this up to 10^27m we see that the universe is about 10^2 or 100 times bigger than the extent of a single gravity field. Our galaxy is said to be

only 5X10^20m across, which is well contained within any single gravity field. A galaxy may only affect 1/100 of the rest of the universe, with its gravity. This may explain so many astronomical observations which at present do not fit any theories.

So in the table, both gravity and electromagnetism carry a definition that their ranges are infinite. I would call this an infinity postulate. In the Green Lantern UFT there is a new infinity postulate that the space-time tension of a particle everywhere is MC. The old infinity postulate is not used. Unfortunately, our formula for the range of field based on velocity does not give an easy answer for gravity's field as 10^25 meters. For example, a single g of earth acceleration due to gravity for one second is about 10 m/s. The speed of light C is 3×10^8 m/s. From that, the gravity range of an earth particle would be only 10^7 m. If we multiplied masses in Newton's formula, perhaps we could add exponents to get 10^14. Now the gravitational constant G has a power of 10^-11. If this were inverted and the exponent was added, then we would get 10^25 meters.

Spin cycles for field strength

If we subtract exponents in the above table we see that electromagnetism is 10 to the 28th power stronger than gravity, or 10^28. The two forces have different inverse square laws, one based on charge Q and the other based on mass M. Our Green Lantern field should only have a single inverse square law. Besides that law, it also has the new Euler factor e^(nπi) where the exponent n pi i allows for many cyclical waves or spins represented by the letter n. The value of n may be the only difference in field strengths. For comparison, let us say that n equals 1 for the gravity field G and we don't know the value of n for the electromagnetic field Q. We do know that the ratio or fraction Q/G equals 10^28. All other field formulas in the fraction have canceled out leaving only:

e^(nπi) / e^(πi) = 10^28. This simplifies to e^((n-1)πi) = 10^28. Solving for n we get:

n = (28 ln10) / (πi) + 1 as how many more cycles or spins the enfielded particle had to make to go from gravity to electromagnetic strength. In this context if we treat the i as just one then the value of n is 21.522 or 21 and a half spins. Similar calculation results for strong and weak forces will appear in a table below.

Inertia, where is +/- always

The value of n may also determine where is a +/- polarity in the Green Lantern field, which is always seen in Q but never recognized in gravity's G. Consider the first cover above for Green Lantern issue 123 with its curving lines showing Hal's flight against gravity. Instead of a sideways S pattern, imagine the two curves extended into complete circles side by side: a OO pattern. This could represent the spinning (st) cycles of two enfielded masses. General relativity would make this out to be the (st) funnels of mass without any spin. By spin I refer to the n value of the Euler field factor. If the spins are in the same direction they have the same sign whether +/+ or -/-. If the spins are in the opposite direction they have different signs whether +/- or -/+, and the circular paths will come around to go through the middle of the OO shape in the same direction. This is opposite signs attracting in (st). If the spins are in the same direction and get out of sync the paths will collide in the middle of the OO, opposing each other in reverse direction. This is repulsion of the same signs whether +/+ or -/-.

The question remains, where is repulsion with the force of gravity? All around us we see everything attracted with gravity as if everything has opposite +/- polarities. Part of the answer may be in an anthropic principle: If the anti-gravity were not already gone we would not be here to notice. There are suggestions that galaxies are separating at an accelerating rate, and this would clearly be due to repulsion of their net gravitational fields. The cosmological constant of general relativity may then be an index of anti-gravity repulsion. On an everyday level, where else could anti-gravity repulsion show up? Modeling gravitational motion occurs in two dimensions, one in the direction of attraction and the other at an inertial right angle. Inertia is plain velocity not acceleration so it is a momentum not a force. The momentum that keeps two masses moving away from each other or towards each other as the case may be. Maybe sometimes inertia is from the force of repulsion. In a broader inertial frame of reference where special relativity would apply, but too local for general relativity, anti-gravity only happens on a gravity scale. In a Green Lantern UFT there is only one kind of repulsion: when n values get out of sync.

Quantum unit basis

One way to get a real value of n is to use quantum theory and Planck's constant h. Combining E=hF and E=MC^2 makes MC^2=hF which gives the frequency F= MC^2/h for a matter wave. If we put in the numbers for the reduced constant h and the Planck mass then we get:

2.18X10^-8 (3X10^8)^2 / 1.05X10^-34 = 18.6857X10^42 = 1.8X10^43

gThis is the Planck frequency in Hz for the upper bound of electromagnetic or cosmic rays. Since this is the highest possible frequency, it can represent the strongest force of nuclear binding.

Radioactivity-binding +/-

The next table will show the relative spin-cycle n values for each force and also their characteristic electromagnetic spectrum frequencies:

Force	Magnitude	Frequency Hz	Relative n
strong	1	10^43	30.317
electromagnetic	10^-12	10^31	21.522
weak	10^-14	10^29	20.056
gravity	10^-40	10^3	1

The characteristic frequencies for electromagnetic and weak force are both in the high gamma range. Since gamma rays are part of radioactivity emissions this is not surprising for the weak force. It is more surprising that it would be the basis of charge Q. Gravity does give a good fit merely by subtracting exponents, though of course gravity waves are not considered electromagnetic waves.

We can now fill in the missing velocities in our first table above for the strong and weak nuclear forces. Use the field definition of range times velocity equals c, or R X V = C. For the strong nuclear force, its range is 10^-15m while the speed of light C is 3 X 10^8 m/sec. V would have to be 10^23 for the exponents to work, which is impossible for a single particle, but we have two particles multiplying in the inverse-square relation. As was done with the gravity example above, we will also consider the gravitational constant with its exponential power of 10^11. So from an exponent of 23 we subtract 11 and then divide by 2 leaving 23-11 = 12 / 2 = 6 for the exponent. So the revealed mass particle velocity in a field of nuclear binding strength is 10^6 m/sec.

Similarly for the weak nuclear force, its range is 10^-17m. To get a light speed C value of 10^8 m/sec, V would have to be 10^25 for the exponents to work. Again we subtract the gravitational constant's power and divide the result by 2 since

two particles are multiplying their fields together. 25-11 = 14 / 2 = 7 so the revealed particle velocity involved in the weak force is 10^7 m/sec. Weak forces emit particles and gamma rays, so regardless of electromagnetic charge there is still a repulsion occurring due to out-of-sync spin-cycle values of n.

The cover to Green Lantern issue 9 shows the usual way binding force is thought of. As Hal Jordan is stuck to the lamp by the superior force of Sinestro, so the binding force is assumed to overcome the like-charge repulsion of protons. If there is only a single binding inverse-square force then this is no longer the case.However, if experiment does show that such amounts of energy are involved in the nucleus then it makes sense to keep these relative magnitudes of forces to make the tables for this Green Lantern UFT. Here our comic book speculation is at an end, and we still do not have a mechanism for how a Green Lantern's willpower can influence the field.

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Posted: Nov 2026

A Universe SciFi Power Rings Can Play In

By Michael Griffin, or ML Fringe

1. Development of science fiction rings

From the article “Magic Ring” in Wikipedia, the free encyclopedia:
“In the DC Universe, the members of the Green Lantern Corps wear power rings that have a scientific, not magical, basis. These rings allow the bearer to perform

any feat he can imagine, but are limited by his willpower. The Blackest Night storyline reveals the existence of similar rings of other colors, powered by other emotions such as greed and hope."

A good science fiction power ring should allow its wearer to fly through the vacuum of space, and also give examples of how the power ring can create things. What is the ring's power stuff? To spin it into theory, it must be a solid single substance, not matter or atoms, a unified material that can act as solid force yet move as if just light speed of pure energy, speed of thought. Thus, we need a single, pure force field of matter that can easily shift into energy. The will of thought shapes it while its power comes from the ring's charge.The ring uses a single energy that can store as a charge. It reshapes at the will of thought into forces of matter.

2. A Universe Needed

A single UFT force for the ring

So how can energy and matter be two forms of the same thing? Let us recall that basic truth written as E=MC^2 or E equals MC squared. Since this article is merely scifi speculation, we are not bound by the rigorous mathematical constraints of known physics. We can form a new interpretation of space-time (st) intended for compatibility with as many basic principles that fit.

Covering the 4 forces

For classic unified field theory (UFT), we are concerned with the four basic forces of gravity, electromagnetism, nuclear binding, and radioactivity. Each of these forces is illustrated by one idea. Gravity is represented by a planet in space. Nuclear binding and radioactivity are illustrated by in the nucleus of the atom, protons are bound together in spite of their repelling electric charges. The nucleus can also discharge particles or radiation, radioactivity, which would be going away from the nucleus.

An actual illustration of electromagnetism would have dotted lines to show the magnetic field. Electric current flow lines up electrons, or if a bar magnet has the electrons lined up in the same orientation, the effect is the same as current flow, to create a field. We could take the direction of current flow as fitting the "right hand rule" of a field curving around like fingers curled up behind the right hand's pointing thumb.

3. Action Principles

Speed-field relation

Electromagnetism is also modeled as the electromagnetic wave spectrum, which also is modeled with particle properties. A particle of light is called the photon, typically considered as energy without mass. The constant speed of light, c, in all frames of reference led to the theory of special relativity. General relativity models the curvature of space and time by gravity from mass. One way it was confirmed is by observing the bending of light rays near the sun. Massless photons with no field of their own are still affected by a gravity field just because space itself is curved. If something is mass, it can never reach the speed of light, according to relativity.

For our science fiction substance, we will not make a sharp distinction between mass and energy. Instead, we will compare fields and particle speeds:

	Speed	Field range
Photon	c	0
Weak nuclear	?	10^-17m
Strong nuclear	?	10^-15m
Electromagnetic charge on a mass	Current flow	observable
Gravity mass	Inertia or g acceleration	interstellar

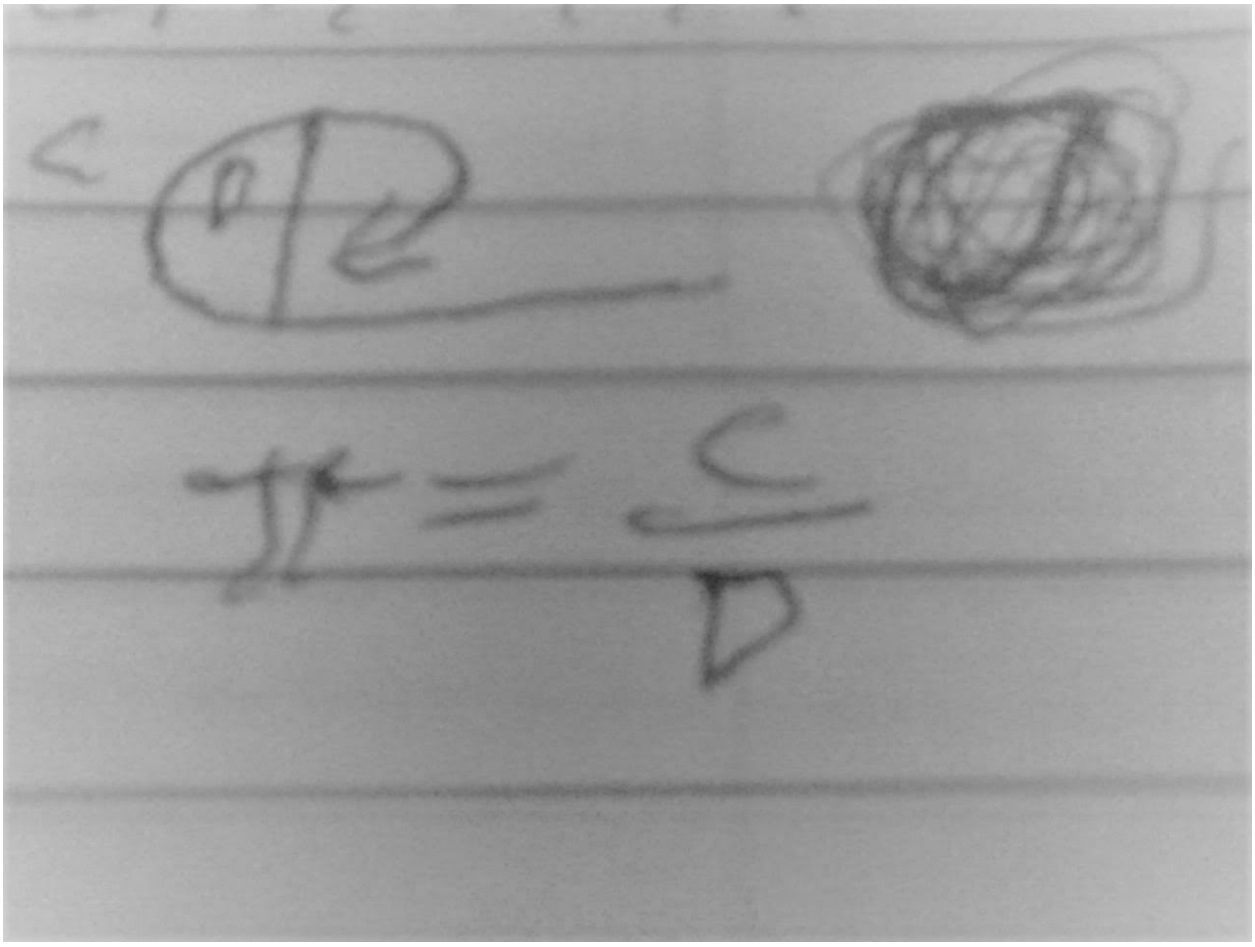
It seems there is an inverse relation between speed and field. A slower speed has a bigger field.

What is a field? Definition

A field is an area where force or some other quality manifests. We will address the aspects of speed, range, intensity, force, and momentum to derive a science fiction UFT. Begin with E=MC^2 or E equals MC squared, or energy equals mass times the speed of light times the speed of light. This is a kind of statement of the ultimate potential energy in mass. Dividing both sides of the equation by the speed of light, we now have E/C=MC. This is a momentum field of mass times the speed of light. Here we depart from relativity theory because in real-world physics this is supposed to be impossible. So our science fiction's mass M is not yet matter in the conventional sense. If it is really moving at the speed of light C then it is a photon. It can be modeled as an electromagnetic force, but it does not have the force fields of matter like gravity, binding, or radiation. It moves in a straight path as energy, whereas all the fields of matter would confine it to a local area. To become fielded as matter, it's straight line path must change.

Enfielding by Euler's

There is a mathematical symbol which is interpreted in physics to mean rotate 90°. It is the letter i which also stands for the square root of negative one, $\sqrt{-1}$. This is part of Euler's famous equation e to the pi i plus1 equals zero: $e^{(\pi i)} + 1=0$ or $e^{(\pi i)} = -1$. The symbol pi or π is defined as the ratio of the circumference to the diameter of a circle, and Euler's equation can be interpreted as a way to describe cyclical patterns. If a straight path photon of energy begins a 90° or 90-degree rotation from the diameter of the circle to move along the circumference we can say that it has become enfielded into matter.



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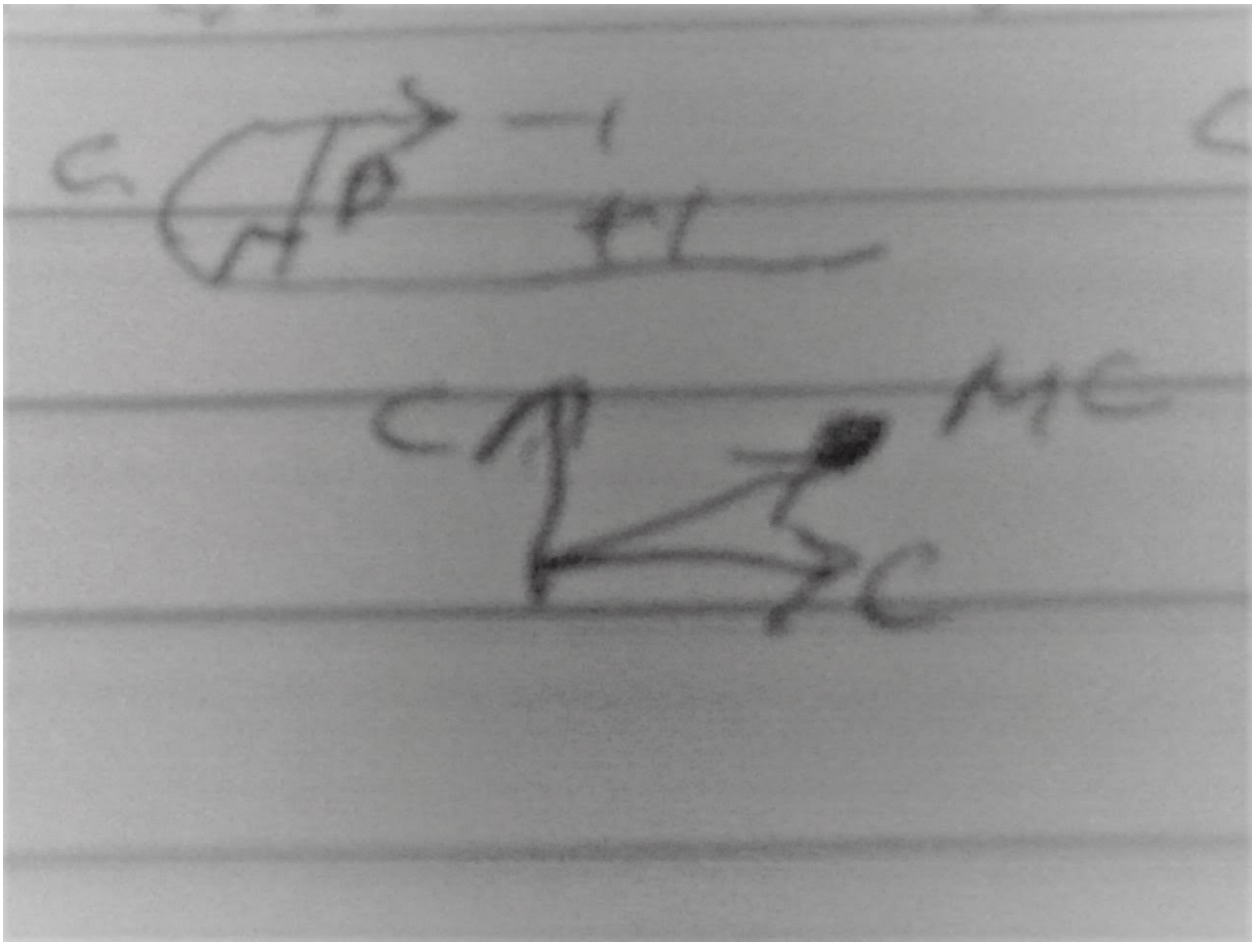

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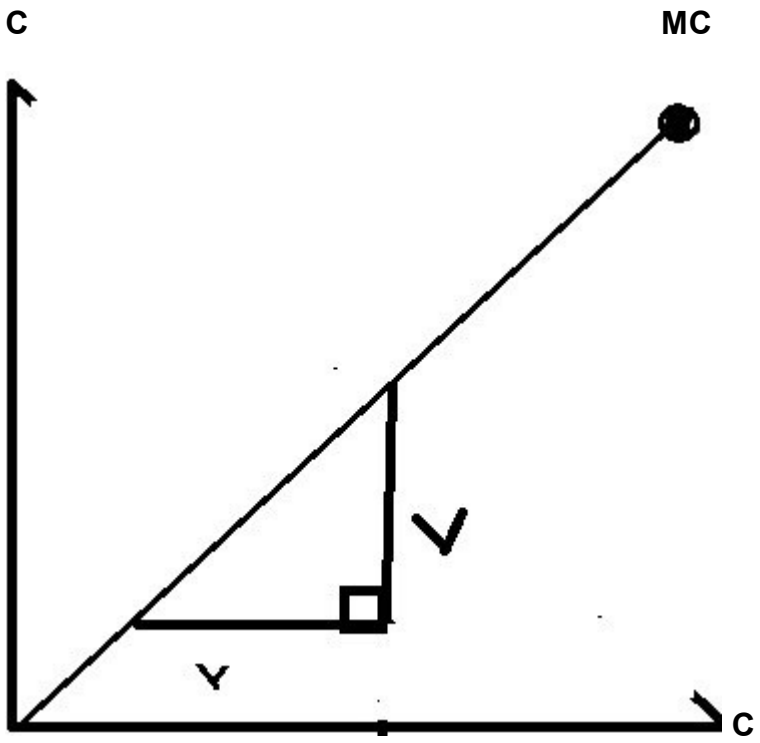

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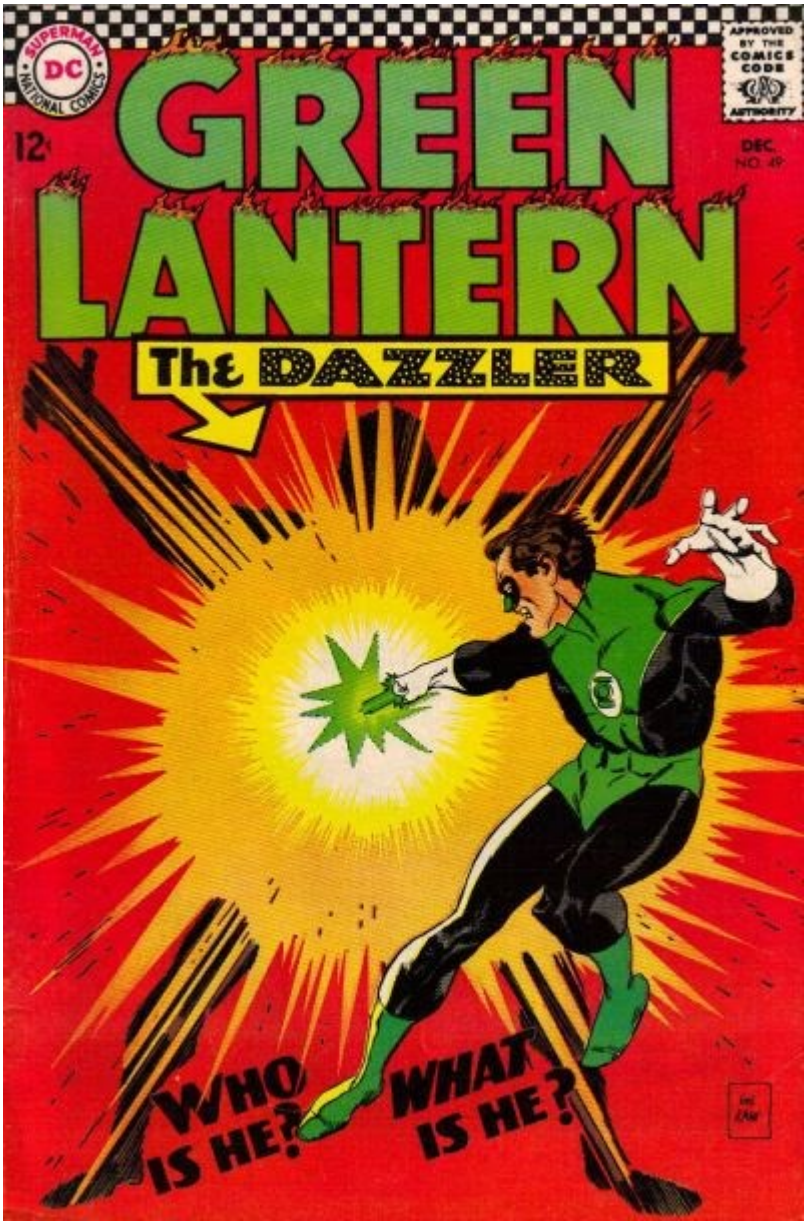

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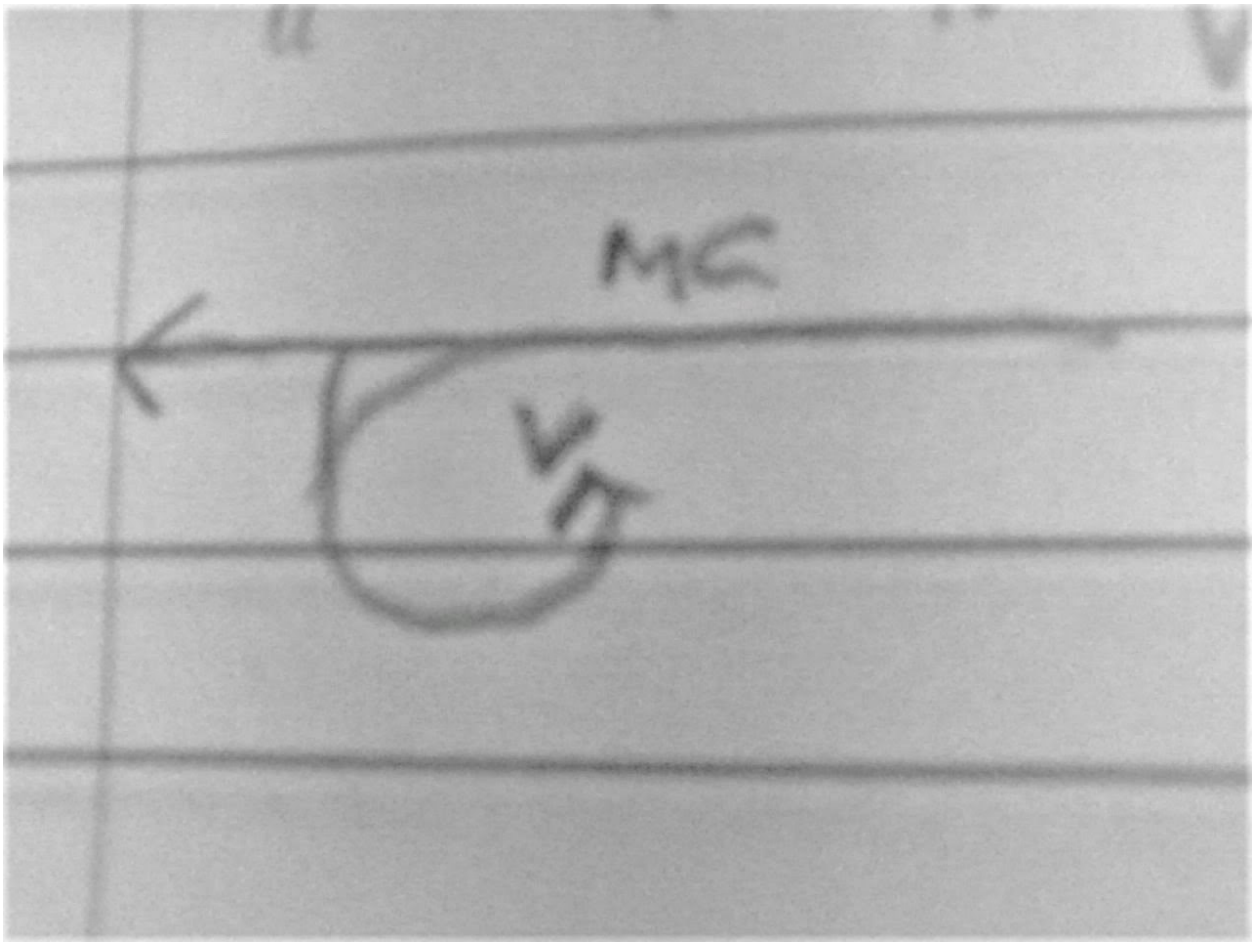
Since R = C/V there is now some justification for the traditional Infinity postulates of fields: as V approaches 0 the range factor approaches Infinity for that special frame of reference.

Look at the above diagram of the path of MC in a CXC grid. Using the Pythagorean theorem, break Its C vector into its right-angle velocity components v and V:

v^2 + V^2 = C^2 v^2 = C^2 - V^2 v^2/C^2 = C^2/C^2 - V^2/C^2

v^2/C^2 = 1 - V^2/C^2 so v/C = $\sqrt{}$(1 – V^2/C^2) and if Rv = C then R = C/v

But C/v = 1/(v/C) which = 1/$\sqrt{}$(1 – V^2/C^2) which is the Lorentz transform factor (Ltf) so the range factor R of v = the Ltf of its co-component V. The velocity components v and V come from the enfielding of mass M into (st). Special relativity's Ltf is generated here by the mass distortion of (st).



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The value of n may be the only difference in field strengths. For comparison, let us say that n equals 1 for the gravity field G and we don't know the value of n for the electromagnetic field Q. We do know that the ratio or fraction Q/G equals 10^28. All other field formulas in the fraction have canceled out leaving only:

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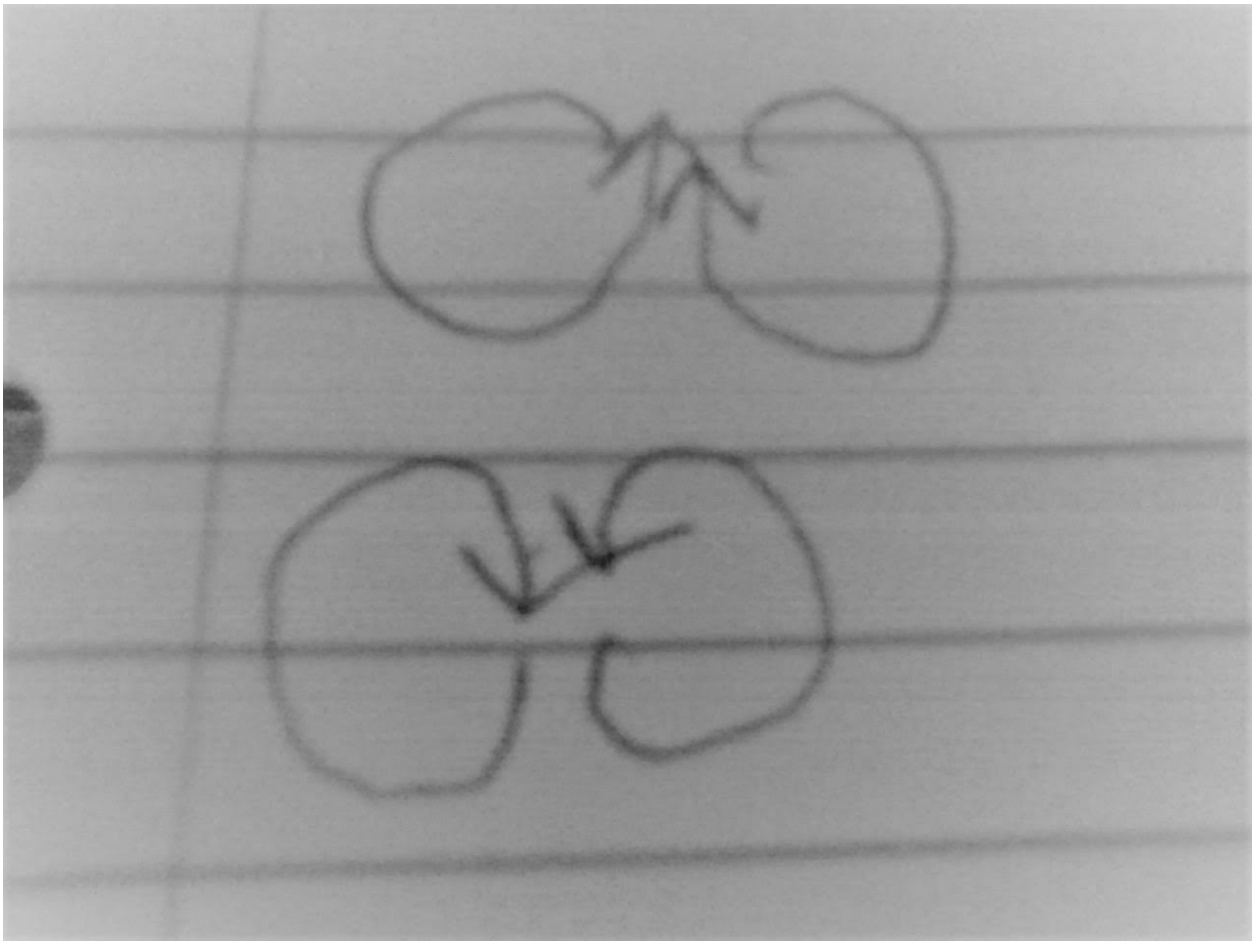
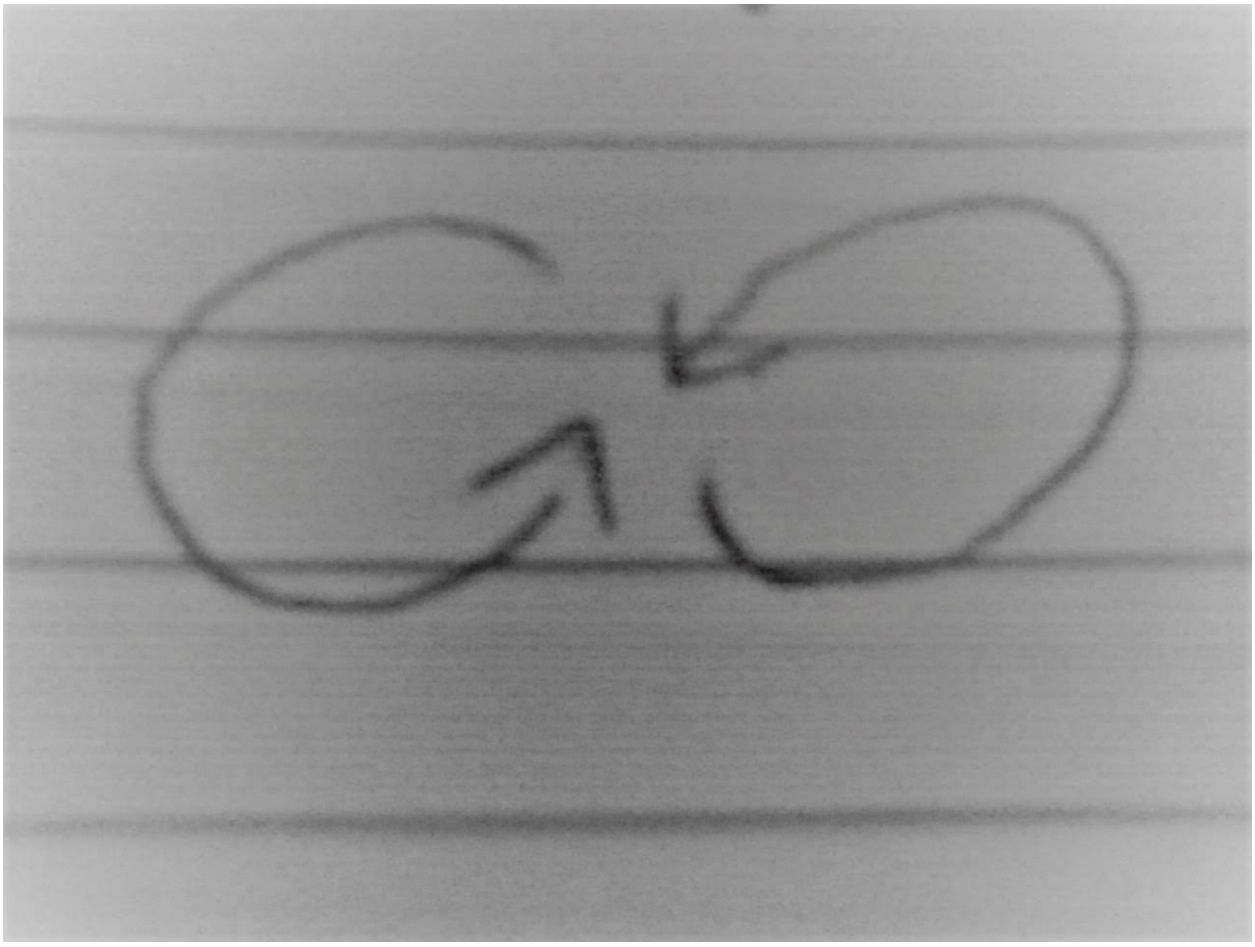


If the spins are in the opposite direction they have different signs whether +/- or -/+, and the circular paths will come around to go through the middle of the OO shape in the same direction. This is opposite signs attracting in (st). If the spins are in the same direction and get out of sync the paths will collide in the middle of the OO, opposing each other in reverse direction. This is repulsion of the same signs whether +/+ or -/-.



The question remains, where is repulsion with the force of gravity? All around us we see everything attracted with gravity as if everything has opposite +/- polarities. Part of the answer may be in an anthropic principle: If the anti-gravity were not already gone we would not be here to notice. There are suggestions that galaxies are separating at an accelerating rate, and this would clearly be due to repulsion of their net gravitational fields. The cosmological constant of general relativity may then be an index of anti-gravity repulsion.

On an everyday level, where else could anti-gravity repulsion show up? Modeling gravitational motion occurs in two dimensions, one in the direction of attraction and the other at an inertial right angle. Inertia is plain velocity not acceleration so it is a momentum not a force. The momentum that keeps two masses moving away from each other or towards each other as the case may be. Maybe sometimes inertia is from the force of repulsion. In a broader inertial frame of reference where special relativity would apply, but too local for general relativity, anti-gravity only happens on a gravity scale. In a science fiction UFT there is only one kind of repulsion: when n values get out of sync.

Quantum unit basis

One way to get a real value of n is to use quantum theory and Planck's constant h. Combining E=hF and E=MC^2 makes MC^2=hF which gives the frequency F= MC^2/h for a matter wave. If we put in the numbers for the reduced constant h and the Planck mass then we get:

2.18X10^-8 (3X10^8)^2 / 1.05X10^-34 = 18.6857X10^42 = 1.8X10^43

This is the Planck frequency in Hz for the upper bound of electromagnetic or cosmic rays. Since this is the highest possible frequency, it can represent the strongest force of nuclear binding.

Radioactivity-binding +/-

The next table will show the relative spin-cycle n values for each force and also their characteristic electromagnetic spectrum frequencies:

Force	Magnitude	Frequency Hz	Relative n
strong	1	10^43	30.317
electromagnetic	10^-12	10^31	21.522
weak	10^-14	10^29	20.056
gravity	10^-40	10^3	1

The characteristic frequencies for electromagnetic and weak force are both in the high gamma range. Since gamma rays are part of radioactivity emissions this is not surprising for the weak force. It is more surprising that it would be the basis of charge Q. Gravity does give a good fit merely by subtracting exponents, though of course gravity waves are not considered electromagnetic waves.

We can now fill in the missing velocities in our first table above for the strong and weak nuclear forces. Use the field definition of range times velocity equals c, or R X V = C. For the strong nuclear force, its range is 10^-15m while the speed of light C is 3 X 10^8 m/sec. V would have to be 10^23 for the exponents to work, which is impossible for a single particle, but we have two particles multiplying in the inverse-square relation. As was done with the gravity example above, we will also consider the gravitational constant with its exponential power of 10^11. So

from an exponent of 23 we subtract 11 and then divide by 2 leaving 23-11 = 12 / 2 = 6 for the exponent. So the revealed mass particle velocity in a field of nuclear binding strength is 10^6 m/sec.

Similarly for the weak nuclear force, its range is 10^-17m. To get a light speed C value of 10^8 m/sec, V would have to be 10^25 for the exponents to work. Again we subtract the gravitational constant's power and divide the result by 2 since two particles are multiplying their fields together. 25-11 = 14 / 2 = 7 so the revealed particle velocity involved in the weak force is 10^7 m/sec. Weak forces emit particles and gamma rays, so regardless of electromagnetic charge there is still a repulsion occurring due to out-of-sync spin-cycle values of n.

The usual way binding force is thought of, is so the binding force is assumed to overcome the like-charge repulsion of protons. If there is only a single binding inverse-square force then this is no longer the case.However, if experiment does show that such amounts of energy are involved in the nucleus then it makes sense to keep these relative magnitudes of forces to make the tables for this science fiction UFT. Here our speculation is at an end, and we still do not have a mechanism for how a scifi ring's willpower can influence the field.

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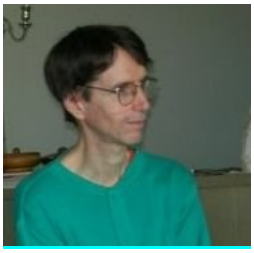
Conclusion

While not directly connected to my previous ideas about organizing mathematics into mythic algebra, there is a similarity in the UFT approach which can be pointed out here. The earlier notion of binary set states such as Mythic/Real is reflected here in the notion of a particle or wavicle as fielded/unfielded. The unfielded basis of space-time can be considered as the overall Association connection whereas fielding reduces that connection to the familiar subset of arithmetic operations. This echo of mythic algebra is not necessary to follow the course of this mathematical speculation. It may show the style and pattern of my intuition, though.



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